



US009120404B2

(12) **United States Patent**
Tachikawa et al.

(10) **Patent No.:** **US 9,120,404 B2**
(45) **Date of Patent:** **Sep. 1, 2015**

(54) **CONVEYANCE SEAT**

USPC 297/61, 336, 378.12, 408
See application file for complete search history.

(75) Inventors: **Yoichi Tachikawa**, Tochigi (JP); **Yusuke Ogata**, Saitama (JP); **Koki Sato**, Saitama (JP); **Nobuo Yokochi**, Saitama (JP)

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,826,942 A * 10/1998 Sutton et al. 297/378.12
6,860,564 B2 * 3/2005 Reed et al. 297/408

(Continued)

FOREIGN PATENT DOCUMENTS

JP 62-17447 U 2/1987
JP 08-258603 A 10/1996

(Continued)

OTHER PUBLICATIONS

Extended European Search Report issued for EP 12763943.3 (Aug. 4, 2014).

Primary Examiner — Peter Brown

(74) *Attorney, Agent, or Firm* — Drinker Biddle & Reath LLP

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 22 days.

(21) Appl. No.: **14/008,110**

(22) PCT Filed: **Mar. 29, 2012**

(86) PCT No.: **PCT/JP2012/058417**

§ 371 (c)(1),

(2), (4) Date: **Sep. 27, 2013**

(87) PCT Pub. No.: **WO2012/133676**

PCT Pub. Date: **Oct. 4, 2012**

(65) **Prior Publication Data**

US 2014/0015288 A1 Jan. 16, 2014

(30) **Foreign Application Priority Data**

Mar. 31, 2011 (JP) 2011-081068

(51) **Int. Cl.**

B60N 2/48 (2006.01)

B60N 2/30 (2006.01)

(Continued)

(52) **U.S. Cl.**

CPC **B60N 2/3088** (2013.01); **B60N 2/309** (2013.01); **B60N 2/3013** (2013.01);

(Continued)

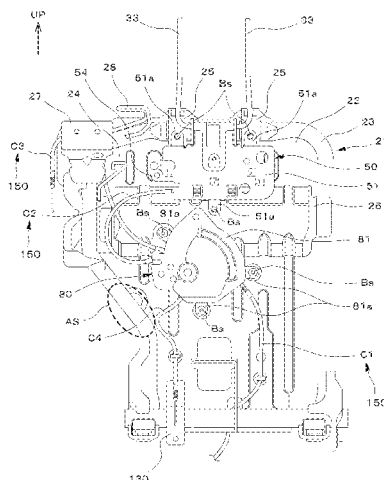
(58) **Field of Classification Search**

CPC B60N 2/4855; B60N 2/4858

(57) **ABSTRACT**

A conveyance seat is provided that includes: a folding mechanism that performs a folding operation for folding the headrest forward; a first receiving portion that receives a first operation when folding only the headrest forward; a second receiving portion that receives a second operation when storing the conveyance seat; a first driving portion that drives only the folding mechanism by the first operation received by the first receiving portion to permit the folding mechanism to perform the folding operation; and a second driving portion that drives the folding mechanism along with the movement of at least one of the seat cushion and the seatback to the storing position permitting the folding mechanism to perform the folding operation when the second receiving portion receives the second operation, wherein the folding mechanism, the first driving portion, and the second driving portion are all attached to the seatback frame provided inside the seatback.

5 Claims, 19 Drawing Sheets



- (51) **Int. Cl.**
B60N 2/36 (2006.01)
B60N 2/68 (2006.01)
B60N 2/44 (2006.01)
- (52) **U.S. Cl.**
CPC **B60N 2/3065** (2013.01); **B60N 2/36**
(2013.01); **B60N 2/366** (2013.01); **B60N**
2/4858 (2013.01); **B60N 2/68** (2013.01); **B60N**
2002/445 (2013.01); **B60N 2002/4897**
(2013.01)
- 7,325,877 B2 * 2/2008 Brockman et al. 297/408
8,016,354 B2 * 9/2011 Veluswamy et al. 297/320
8,197,001 B2 * 6/2012 Grable et al. 297/61
8,662,578 B2 * 3/2014 Szybisty et al. 297/61
8,845,026 B2 * 9/2014 Kobayashi et al. 297/324
2007/0236069 A1 10/2007 Chung
2009/0134683 A1 * 5/2009 Furukawa et al. 297/391
2010/0078972 A1 4/2010 Sayama

FOREIGN PATENT DOCUMENTS

- (56) **References Cited**

U.S. PATENT DOCUMENTS

JP 2007-302141 A 11/2007
JP 2010-105655 A 5/2010
JP 2011-011665 A 1/2011
WO WO 2006/128290 A1 12/2006

7,152,921 B2 * 12/2006 Saberan 297/336
7,258,400 B2 * 8/2007 Yamada 297/378.12

* cited by examiner

FIG. 1

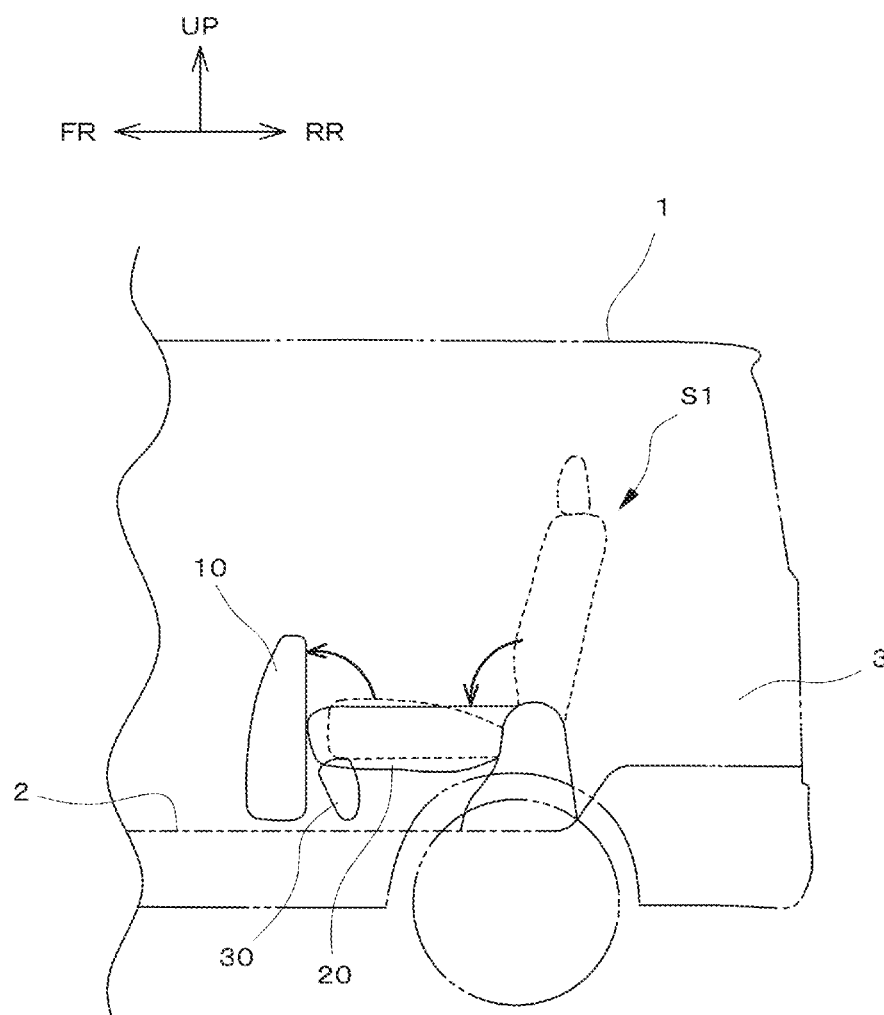


FIG. 2

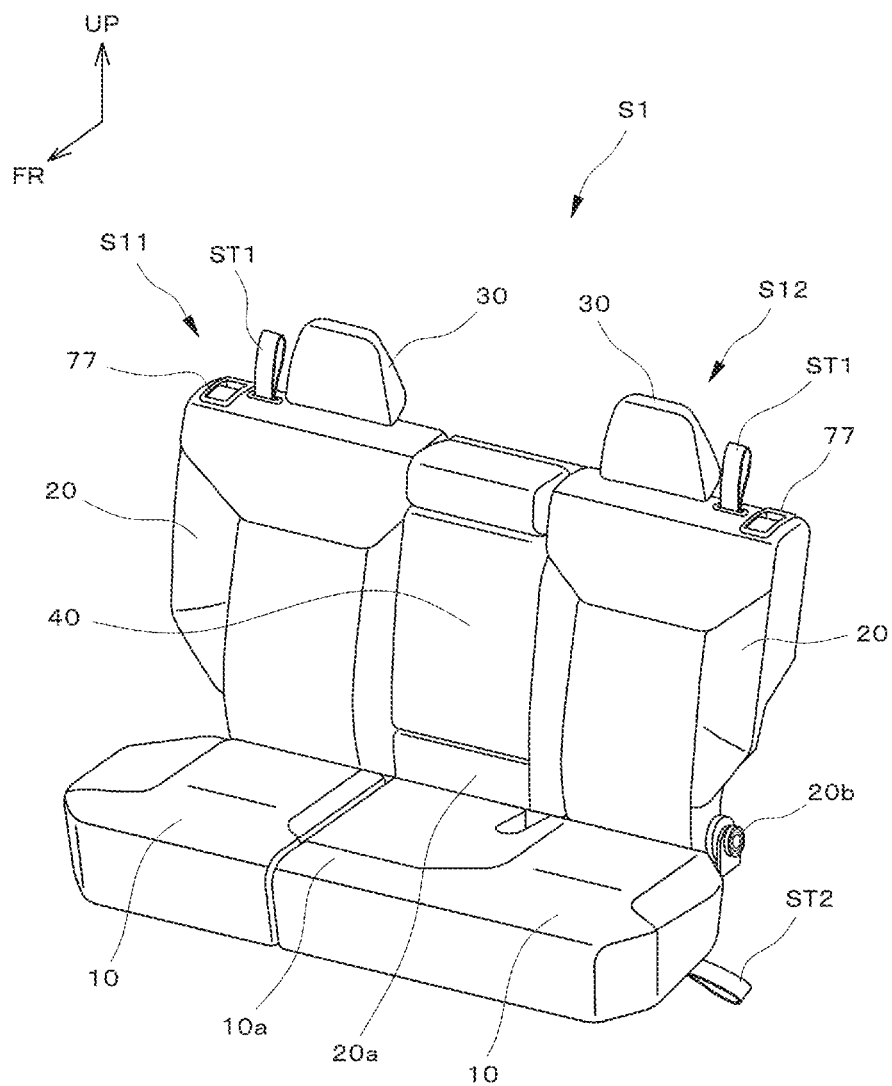


FIG. 3

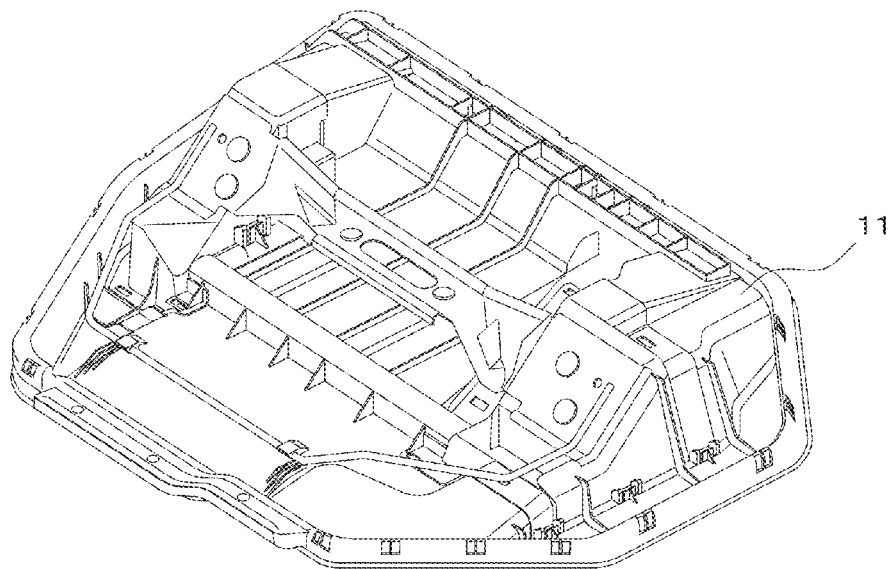


FIG. 5

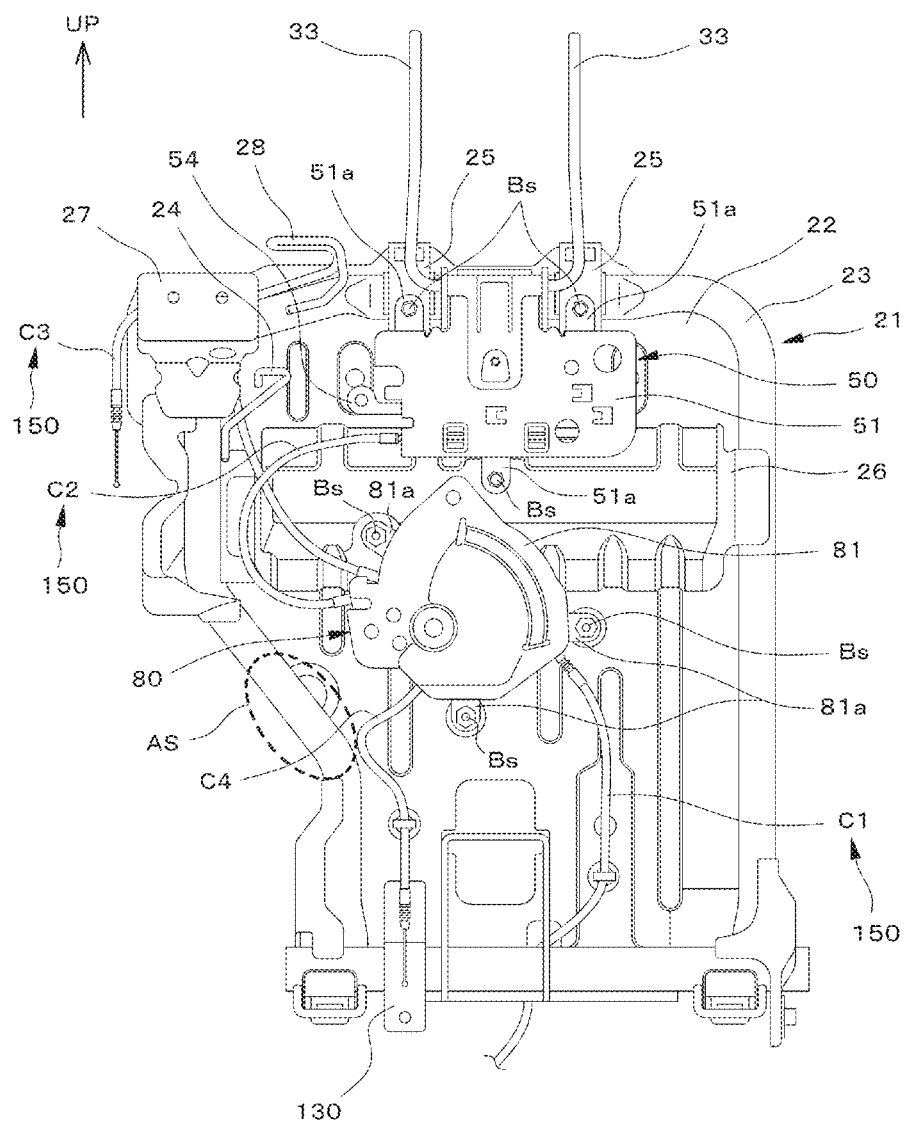


FIG. 6

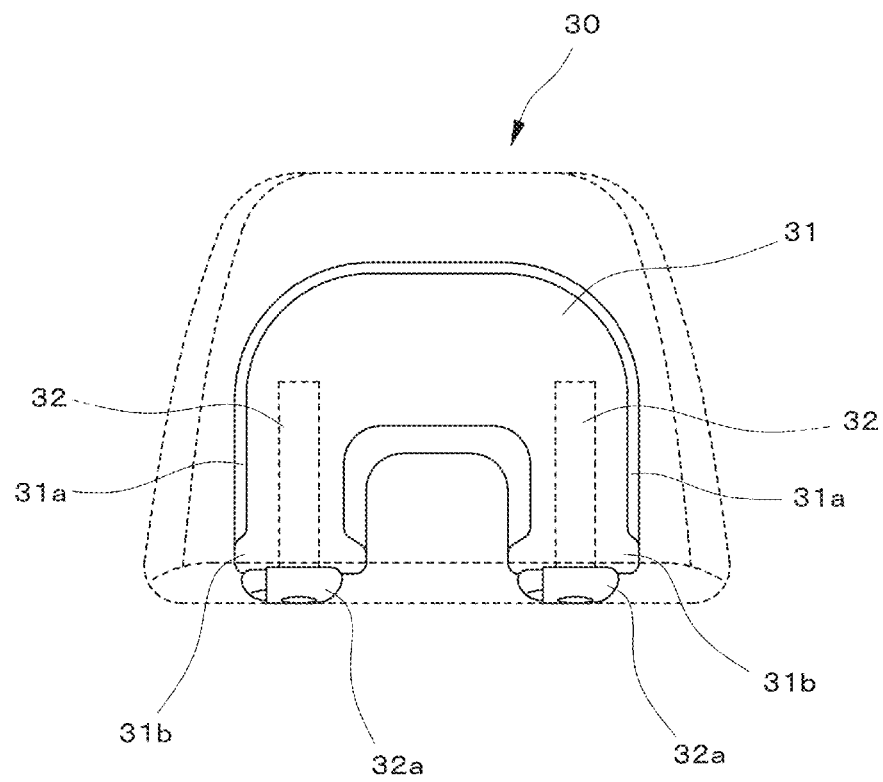


FIG. 7

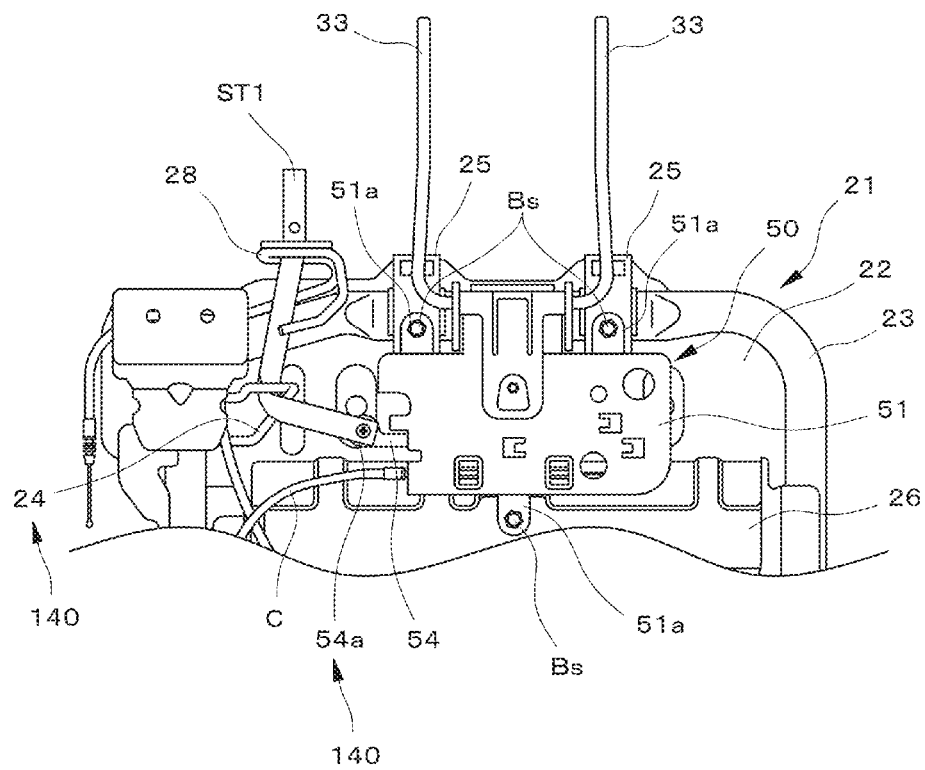


FIG. 8

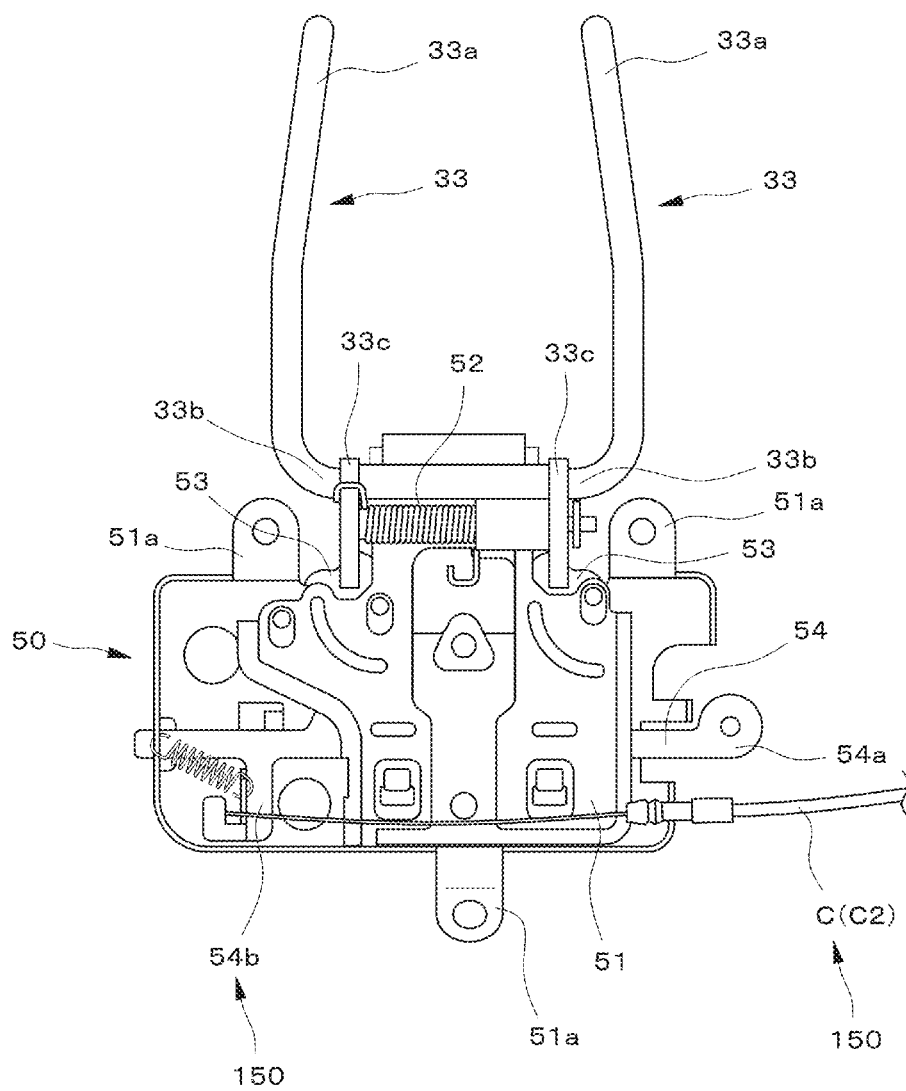


FIG. 9

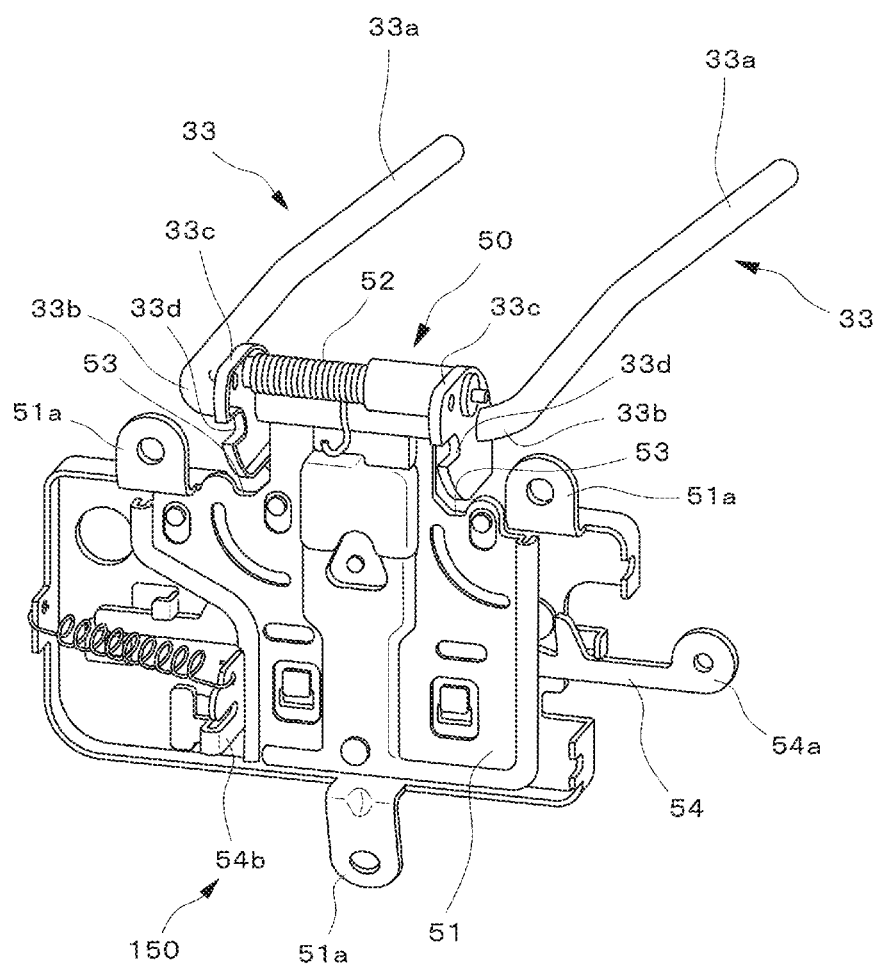


FIG. 10

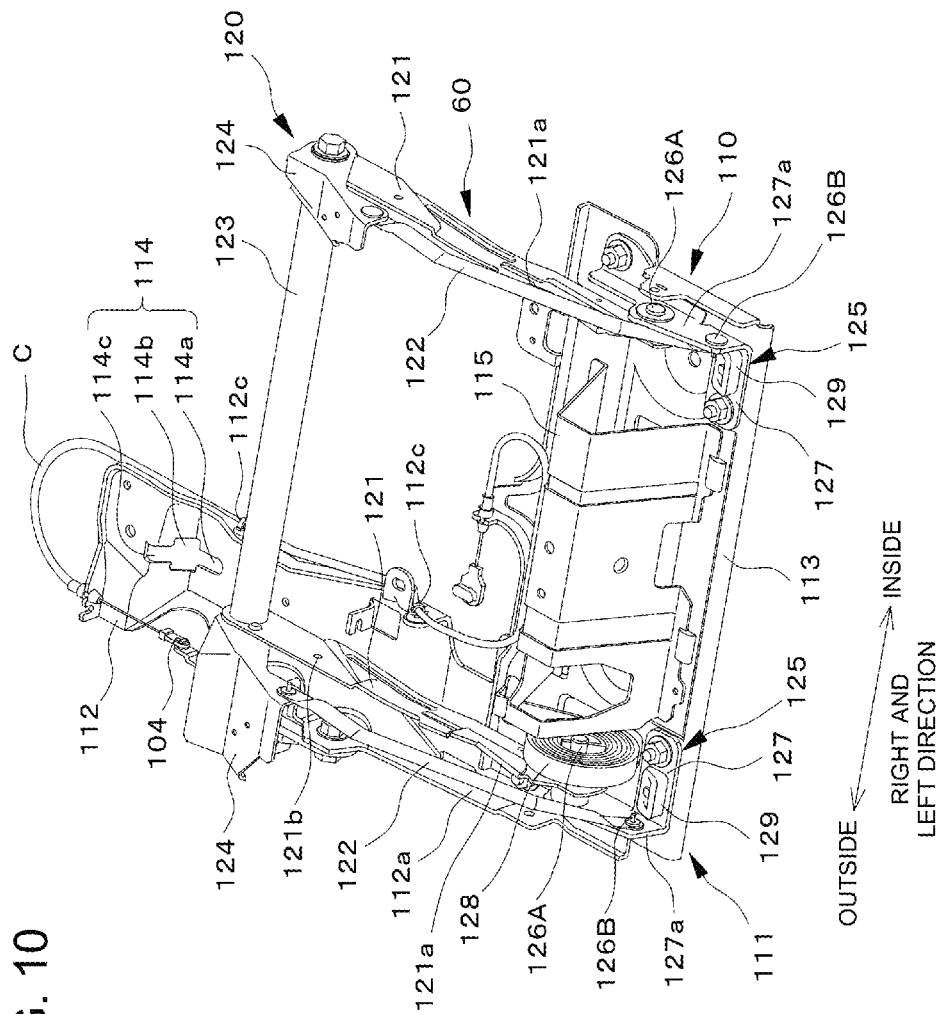


FIG. 11

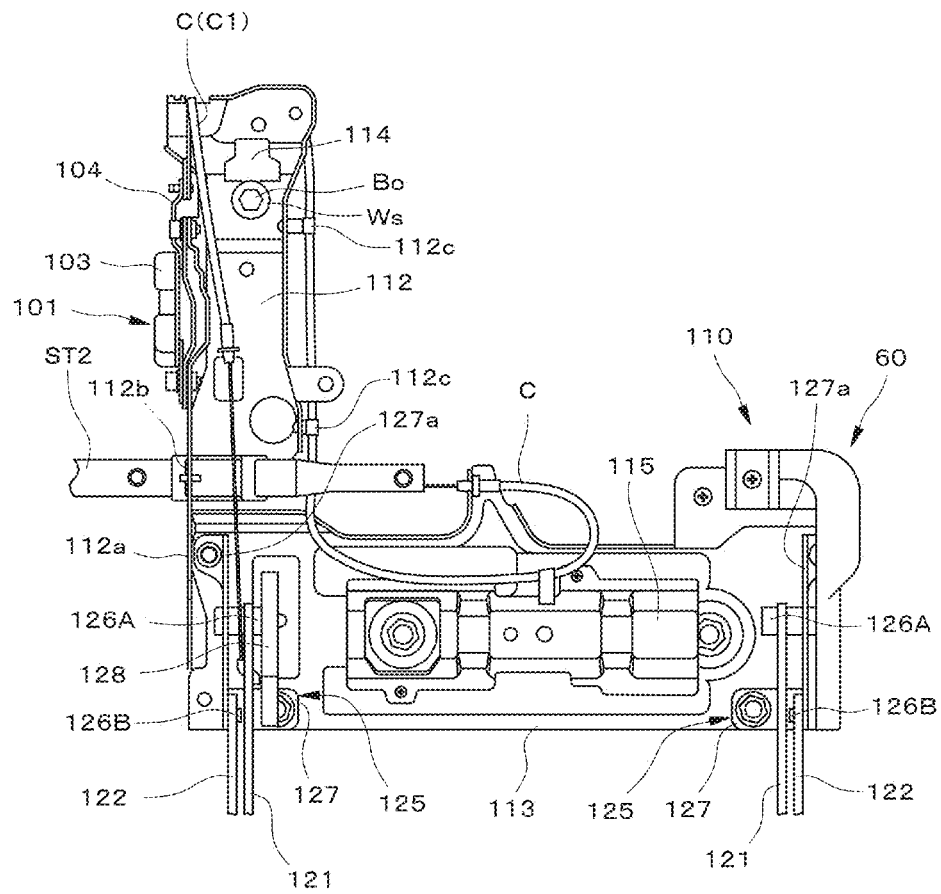


FIG. 12

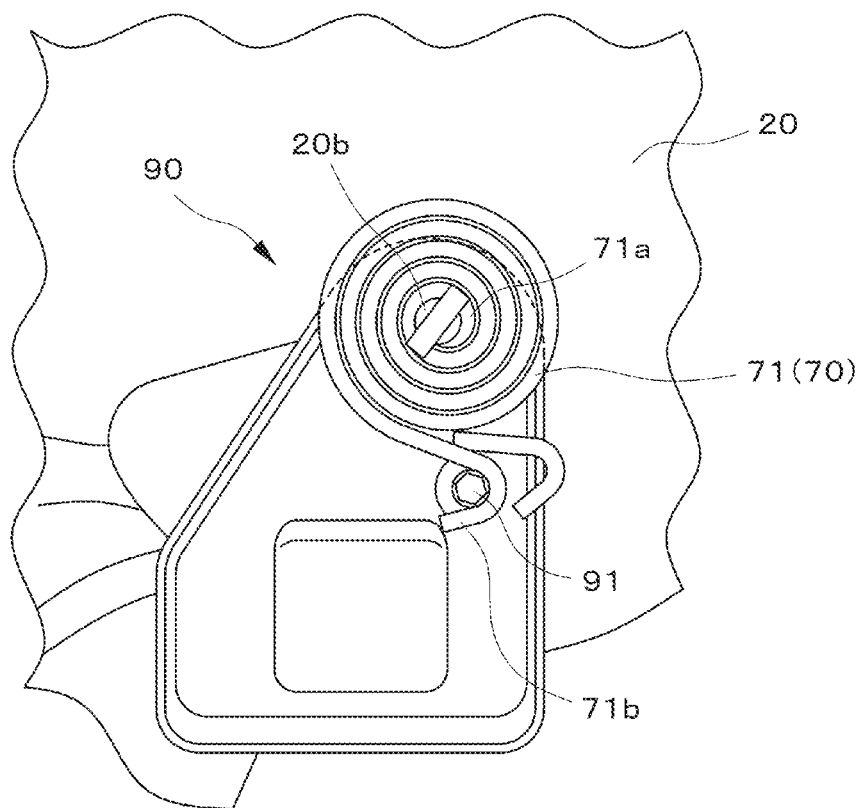


FIG. 15A

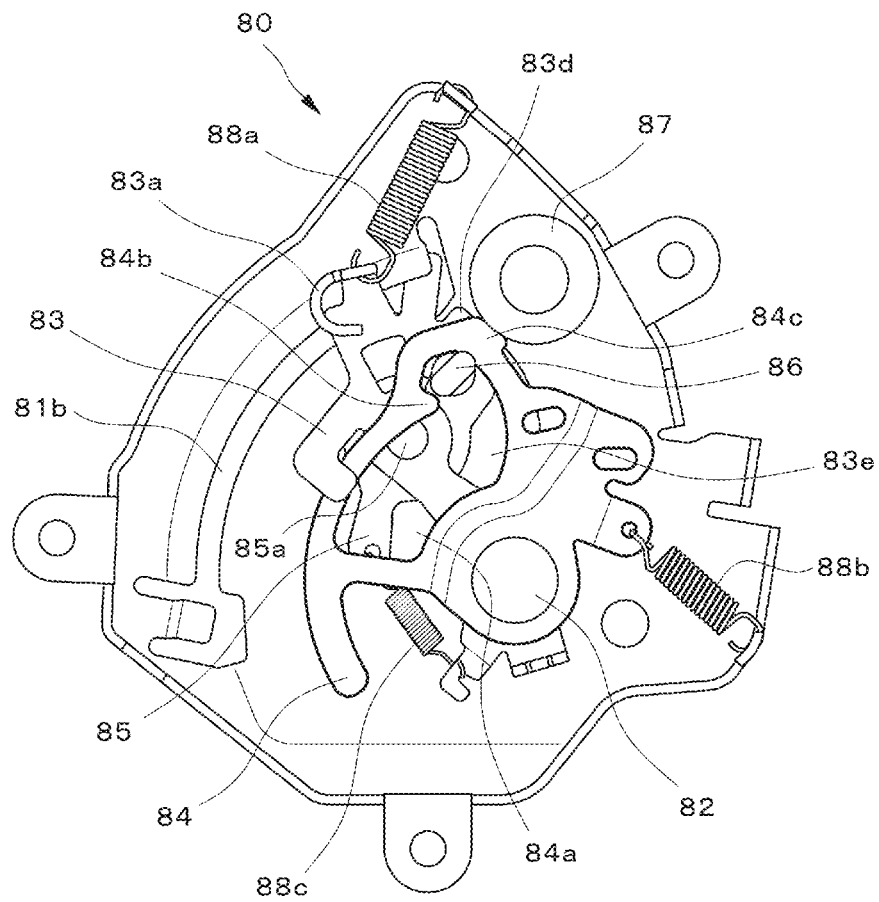


FIG. 15B

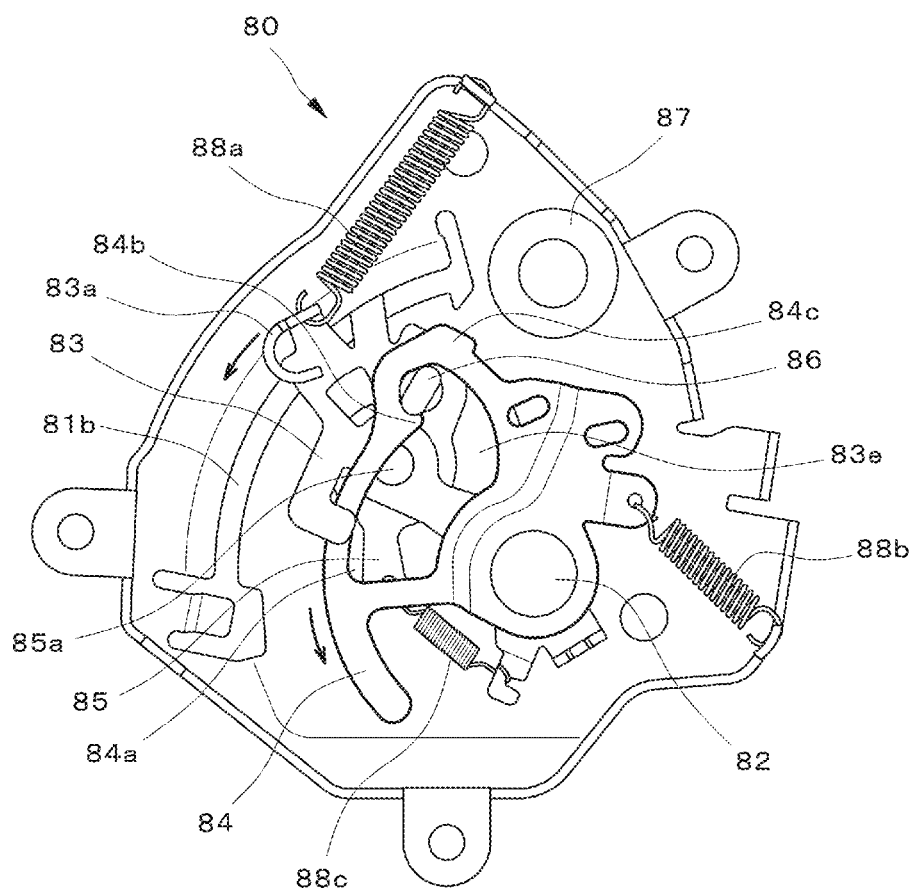


FIG. 15C

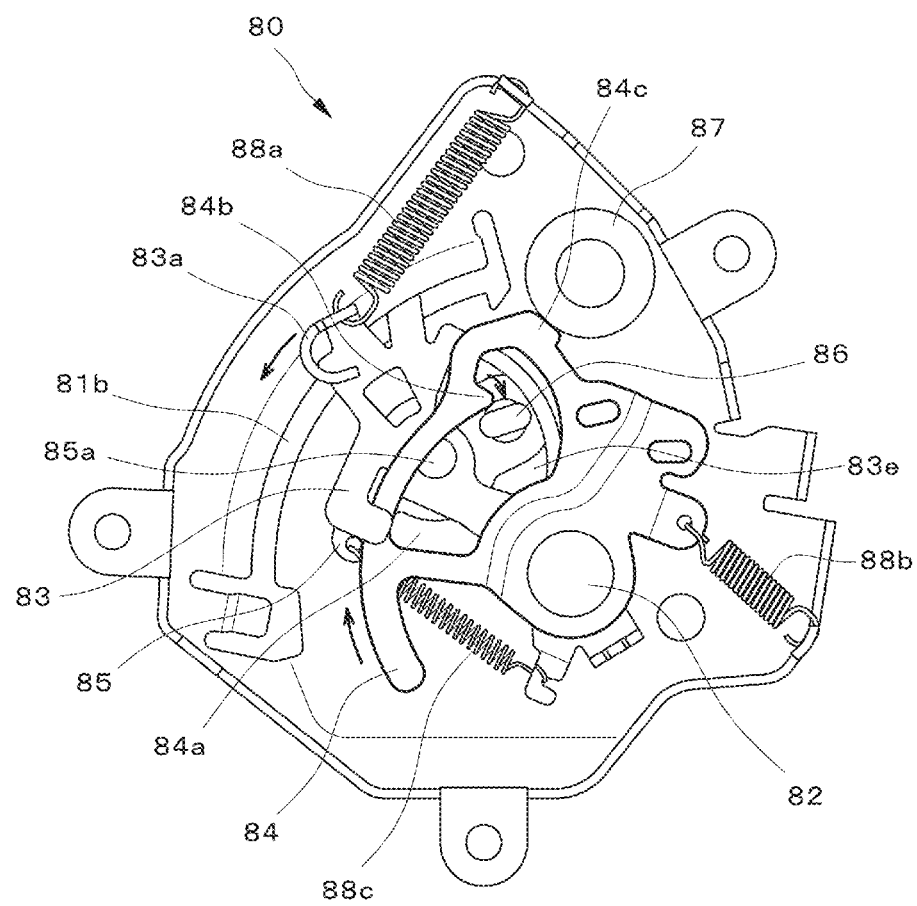


FIG. 15D

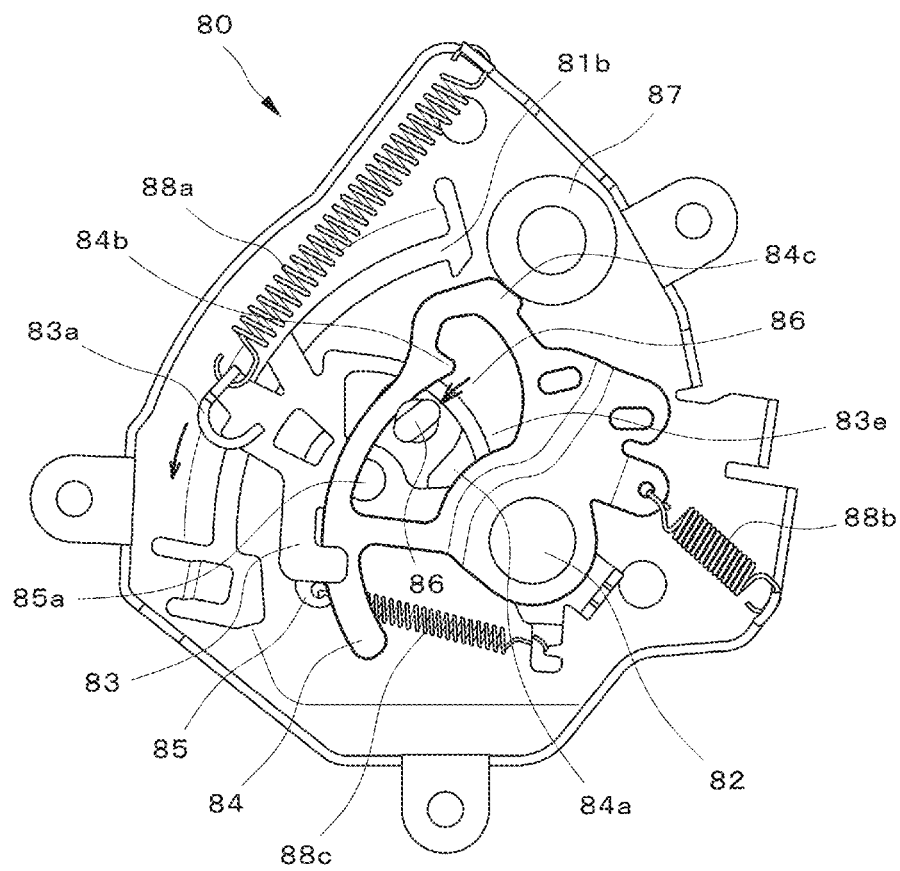
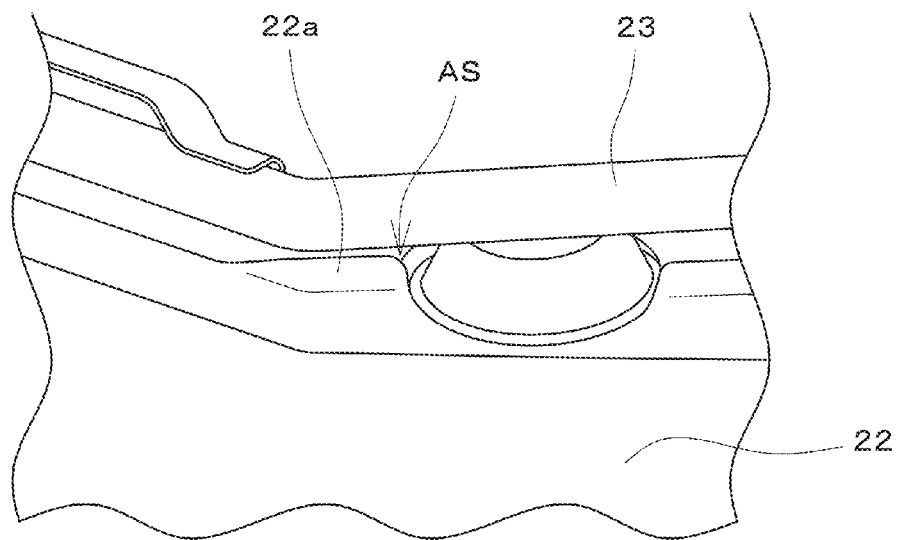


FIG. 16



1

CONVEYANCE SEAT

CROSS REFERENCE TO RELATED APPLICATIONS

This application is the U.S. national phase of the International Patent Application No. PCT/JP2012/058417, filed Mar. 29, 2012, which claims the benefit of the following Japanese Patent Application: Application No. 2011-081068, filed Mar. 31, 2011, the entire content being incorporated herein by reference.

BACKGROUND

Disclosed herein is a storable conveyance seat which includes a seat cushion, a seatback, and a headrest, and particularly, a conveyance seat which may fold a headrest forward along with a movement of at least one of a seat cushion and a seatback to a storing position and may fold only the headrest forward.

Storable conveyance seats each including a seat cushion, a seatback, and a headrest have been known. Among these conveyance seats, there are conveyance seats that may fold a headrest forward.

Then, among the conveyance seats that may fold the headrest forward, there is a conveyance seat in which the headrest folding operation may be performed not only directly at the headrest but also a remote position (for example, see Japanese Patent Document No. 2010-105655 A (“the ‘655 Document”). That is, in the conveyance seat disclosed in the ‘655 Document, two paths are provided which receive the forward headrest folding operation.

Further, among the conveyance seats that may fold the headrest forward, there is also a conveyance seat in which the headrest may be folded forward in accordance with the movement of the seat cushion or the seatback to the storing position (for example, see Japanese Patent Document No. 2011-011665 A (“the ‘665 Document”).

As a specification of the conveyance seat, there may be a demand in which the headrest is folded forward along with the movement of the seat cushion or the seatback to the storing position and the headrest is independently folded forward. It is also desirable to employ the conveyance seat in which the respective components of the seat may be easily combined or connected to each other and smoothly assembled.

In order to realize the above-described specification, for example, when the technique of Document ‘655 is applied to the conveyance seat of Document ‘665, there is a need to pull a transmitting member (specifically, a cable or the like), transmitting a driving force for driving a folding mechanism from the outside (of the headrest), into the headrest, since the folding mechanism for folding the headrest forward is provided inside the headrest in the technique of Document ‘655. For this reason, if the technique of Document ‘655 is applied to the case of performing the headrest folding operation along with the movement operation of the seat cushion or the seatback to the storing position, a length (hereinafter, a wiring length) in which the transmitting member is wired inside the seat is lengthened so that the assembling workability becomes insufficient.

SUMMARY

Therefore, the embodiments of the present invention are made in view of the above-described problem, and it is an object of embodiments of the present invention to realize a

2

conveyance seat with further satisfactory assembling workability by performing a headrest folding operation along with a movement of a seat cushion or a seatback to a storing position or independently performing the headrest folding operation.

The above-described problem may be solved by a conveyance seat that comprises a seat cushion, a seatback including a seatback frame therein, and a forward foldable headrest and the seat back is stored by moving at least one of the seat cushion and the seatback to a storing position and folding the headrest forward, the conveyance seat further comprising: a folding mechanism that performs a folding operation for folding the headrest forward; a first receiving portion that receives a first operation performed by a passenger when folding only the headrest forward; a second receiving portion that receives a second operation performed by the passenger when storing the conveyance seat; a first driving portion that drives only the folding mechanism by the first operation received by the first receiving portion to permit the folding mechanism to perform the folding operation; and a second driving portion that drives the folding mechanism along with the movement of at least one of the seat cushion and the seatback to the storing position to permit the folding mechanism to perform the folding operation when the second receiving portion receives the second operation, wherein the folding mechanism, the first driving portion, and the second driving portion are all attached to the seatback frame.

According to such a configuration, since the folding mechanism, the first driving portion, and the second driving portion are all attached to the seatback frame, there is no need to pull the transmitting member into the headrest. Accordingly, the wiring length of the transmitting member may be further shortened. Accordingly, the forward folding operation of the headrest is performed along with the movement of the seat cushion or the seatback to the storing position or is independently performed. Thus, it is possible to provide the conveyance seat with further satisfactory assembling workability.

Further, there is provided the conveyance seat, wherein the folding mechanism may include a pillar that supports the headrest, a support portion that supports the pillar to be rotatable in the front to back direction, a biasing member that biases the pillar forward, a locking member that engages with the pillar to hold the pillar in a standing state against a biasing force of the biasing member, and a slide member that slides to release the engagement state between the locking member and the pillar, wherein the first driving portion may include a fastening portion that is formed in the slide member to fasten the first receiving portion and the slide member to each other, wherein a movement mechanism may be further provided which performs a movement operation for moving at least one of the seat cushion and the seatback to the storing position by the second operation received by the second receiving portion, wherein the second driving portion may include a connection portion that is formed in the slide member to connect the movement mechanism and the slide member to each other, and wherein the fastening portion may be located near the first receiving portion in relation to the connection portion.

According to the above-described configuration, since the positional relation between the first receiving portion and the slide member becomes appropriate in consideration of the operation of the first receiving portion influencing the slide member, it is possible to further improve the assembling workability.

Further, there is provided the conveyance seat further including a casing which accommodates the slide member,

3

wherein a plate shaped pan frame and a pipe frame attached along the outer edge of the pan frame and located at the front side of the pan frame may be provided in the seatback frame, and wherein the casing may be attached to a front surface of the pan frame and may be located between a rear end of the pan frame and a front end of the pipe frame in the front to back direction of the seatback frame.

According to the above-described configuration, since the casing that accommodates the slide member falls between the rear end of the pan frame and the front end of the pipe frame, it is possible to realize a decrease in the size of the conveyance seat (particularly, the seatback).

Further, there is provided the conveyance seat, wherein the slide member may slide in the width direction of the seatback, wherein the first receiving portion may be a belt shaped member that extends from an upper end surface of the seatback, wherein the first operation may be a pulling operation that pulls the belt shaped member along the height direction of the seatback intersecting the width direction, wherein the first driving portion may include a converting portion that converts the pulling operation along the height direction into the sliding movement of the slide member along the width direction, and wherein the converting portion may be a bending member that is attached to the seatback frame and abuts against the belt shaped member to bend the belt shaped member.

According to the above-described configuration, it is possible to convert the belt shaped member pulling operation into the slide member sliding movement with a comparatively simple configuration.

Further, there is provided the conveyance seat, wherein the bending member may abut against the belt shaped member so that the belt shaped member is bent at the front side in relation to a front end of the pipe member in the front to back direction. According to such a configuration, since the contact between the belt shaped member and the pipe frame is suppressed, it is possible to prevent a difficulty in the pulling operation caused by the contact between the belt shaped member and the pipe frame.

Further, there is provided the conveyance seat, wherein the conveyance seat may be a vehicle seat mounted on a vehicle, and wherein the belt shaped member may extend from a portion in the upper end surface of the seatback located at the outside of the vehicle in relation to the headrest in the width direction. According to such a configuration, since the belt shaped member extends from a position which is easily seen by the passenger, the belt shaped member pulling operation is easily performed.

According to the conveyance seat of various embodiments, the headrest folding operation is performed along with the movement of the seat cushion or the seatback to the storing position and only the folding operation is performed. Thus, it is possible to provide the conveyance seat with further satisfactory assembling workability. It is possible to further improve the assembling workability, and to realize a decrease in size (particularly, a decrease in the size of the seatback).

It is further possible to convert the belt shaped member pulling operation into the slide member sliding movement with a comparatively simple configuration, and to prevent a difficulty in the pulling operation caused by the contact between the belt shaped member and the pipe frame. It is also possible to easily perform the belt shaped member pulling operation.

BRIEF DESCRIPTION OF THE DRAWINGS

The following diagrams illustrate various embodiments of the invention, described in more detail below.

4

FIG. 1 is a schematic side view of a vehicle rear part equipped with a vehicle seat S1;

FIG. 2 is a perspective view of the vehicle seat S1;

FIG. 3 is a perspective view of a cushion frame 11;

FIG. 4 is a perspective view (first diagram) of a seat cushion flip-up mechanism 60;

FIG. 5 is a front view diagram illustrating a seatback frame 21 when viewed from the front side thereof;

FIG. 6 is a front view diagram illustrating an inner frame 31 of a headrest 30;

FIG. 7 is front view diagram illustrating a headrest rotating mechanism 50 when viewed from the front side thereof;

FIG. 8 is a rear view diagram illustrating the headrest rotating mechanism 50 when viewed from the rear side thereof;

FIG. 9 is a perspective view of the headrest rotating mechanism 50;

FIG. 10 is a perspective view (second diagram) of a seat cushion flip-up mechanism 60;

FIG. 11 is a plan view diagram illustrating the seat cushion flip-up mechanism 60 when viewed from the top side thereof;

FIG. 12 is a side view diagram illustrating a seatback supporting unit 90 when viewed from the side thereof;

FIG. 13 is a perspective view of a locking mechanism 72 and an operation unit 77;

FIG. 14 is a diagram illustrating an arranging unit 80 when viewed from the rear side thereof;

FIG. 15A is a (first) side view diagram illustrating an operation example of the arranging unit 80;

FIG. 15B is a (second) side view diagram illustrating an operation example of the arranging unit 80;

FIG. 15C is a (third) side view diagram illustrating an operation example of the arranging unit 80;

FIG. 15D is a (fourth) side view diagram illustrating an operation example of the arranging unit 80; and

FIG. 16 is a perspective view diagram illustrating a wiring space AS.

BRIEF DESCRIPTION OF THE DRAWINGS

Hereinafter, an embodiment (hereinafter, this embodiment) according to the present invention will be described by referring to FIGS. 1 to 16.

FIGS. 1 to 16 illustrate a vehicle seat (hereinafter, a vehicle seat S1) according to this embodiment. The symbol FR in the drawings indicates the vehicle front side, the symbol RR indicates the vehicle rear side, and the symbol UP indicates the vehicle upside (or top side). Further, in the description below, the right and left direction indicates the right and left direction while the vehicle faces the front side, and matches the width direction of a seatback 20 to be described later. Further, the height direction of the seatback 20 indicates a direction intersecting the width direction, and the thickness direction of the seatback 20 indicates a direction matching the front to back direction of the seatback 20 (in other words, the front to back direction of a seatback frame 21 to be described later).

As illustrated in FIG. 1, the vehicle seat S1 is an example of a conveyance seat, and is mounted as a rear seat on the vehicle 1 which has a luggage compartment space at a rear part of a vehicle body of an automobile. Particularly, in this embodiment, the vehicle seat is mounted on a wagon type automobile.

Regarding the configuration of the vehicle seat S1, in this embodiment, the vehicle seat is divided into a right (driver seat side) vehicle seat S11 and a left (passenger seat side) vehicle seat S12, and each of the vehicle seats S11 and S12

5

includes a seat cushion **10**, a seatback **20**, and a headrest **30**. Furthermore, an armrest **40** (FIG. 2) is disposed between the seatbacks **20** of the respective vehicle seats **S11** and **S12**. In the left vehicle seat **S12**, the seatback **20** is integrated with a pedestal portion **20a** located below the armrest **40** in FIG. 2, and the seat cushion **10** is integrated with a projection portion **10a** disposed at the lower position of the pedestal portion **20a** in FIG. 2.

The right vehicle seat **S11** and the left vehicle seat **S12** are different from each other in the above-described points, but both vehicle seats **S11** and **S12** have the same basic configurations. For this reason, in the description below, only the configuration of the right vehicle seat **S11** will be described.

The vehicle seat **S1** may switch its posture from a normal posture (which is a posture indicated by the dashed line in FIG. 1 and is referred to as a sitting posture later) in which a passenger may sit on the vehicle seat, to a posture (which is a posture indicated by the solid line in FIG. 1 and is referred to as a storing posture later) in which the seat is stored to form a luggage compartment part **3** in a non-use state. Specifically, the seat cushion **10** flips up toward the vehicle front side when changing the posture of the vehicle seat **S1** to the storing posture. Further, the seat cushion **10** flips up and the seatback **20** rotates forward to be folded to a position where the seat cushion **10** that is not flipped up is disposed on the vehicle body floor **2**. Further, when the headrest **30** rotates forward by about 90° from a state where the headrest is disposed above the seatback **20** in the substantially vertical direction so that the seatback **20** collapses onto the vehicle body floor **2**, the headrest is stored between the seat cushion **10** that is flipped up forward and the folded seatback **20**.

By the above-described series of operations (hereinafter, referred to as storing operations), the vehicle seat **S1** is stored in a compact posture. Then, in the vehicle **1** which employs the vehicle seat **S1** with the above-described configuration as the rear seat, the luggage compartment part **3**, which constitutes a part of the vehicle body floor **2**, is formed at the rear side of the vehicle seat **S1**, and the luggage compartment part **3** is widened to the usable size obtained by the storing operation of the vehicle seat **S1**.

As described above, the vehicle seat **S1** is configured to switch its posture between the sitting posture and the storing posture. Further, in this embodiment, the posture may be switched so that only the headrest **30** is independently folded forward from the sitting posture or the posture may be switched so that only the seatback **20** is independently raised from the storing posture. These various kinds of seat arrangements are realized by various driving mechanisms (specifically, a headrest rotating mechanism **50**, a seat cushion flip-up mechanism **60**, a seatback folding mechanism **70**, and the like to be described later) provided in the vehicle seat **S1**. Hereinafter, a configuration for realizing the seat arrangements of the vehicle seat **S1** will be described.

Furthermore, in the description below, the sitting positions of the seat cushion **10**, the seatback **20**, and the headrest **30** indicate the positions of the seat cushion **10**, the seatback **20**, and the headrest **30** when the posture of the vehicle seat **S1** is held in the sitting posture.

Further, the flip-up position of the seat cushion **10** indicates the position of the seat cushion **10** when the posture of the vehicle seat **S1** is maintained in the storing posture, and corresponds to the storing position of the seat cushion **10**. The folding position of the seatback **20** indicates the position of the seatback **20** when the posture of the vehicle seat **S1** is maintained in the storing posture, and corresponds to the storing position of the seatback **20**. The folding position of the

6

headrest **30** indicates the position of the headrest **30** when the posture of the vehicle seat **S1** is maintained in the storing posture.

Basic Configuration of Vehicle Seat **S1**

In order to describe the configuration for realizing the seat arrangements of the vehicle seat **S1**, the basic configuration of the vehicle seat **S1** will be described. As described above, the vehicle seat **S1** includes the seat cushion **10**, the seatback **20**, and the headrest **30**.

The seat cushion **10** is formed by attaching a surface material to a cushion frame **11** illustrated in FIG. 3. The attachment of the surface material is obtained by locking a trim cord (not illustrated) sewn to the end of the surface material to the outer edge of the cushion frame **11**.

Further, the seat cushion flip-up mechanism **60** illustrated in FIG. 4 is disposed at the lower portion of the seat cushion **10**. The seat cushion flip-up mechanism **60** is fixed onto the vehicle body floor **2**. Then, the seat cushion flip-up mechanism supports the seat cushion **10**, and flips up the seat cushion **10** from the sitting position toward the flip-up position when storing the vehicle seat **S1**.

That is, the seat cushion **10** is fixed to the sitting position on the vehicle body floor **2** through the seat cushion flip-up mechanism **60**, and flips up from the sitting position toward the flip-up position when the seat cushion flip-up mechanism **60** is operated. In other words, the seat cushion **10** may move in a reciprocating manner between the sitting position and the flip-up position.

Furthermore, the seat cushion flip-up mechanism **60** includes a striker locking mechanism **100**. The striker locking mechanism **100** fixes the seat cushion **10** to the sitting position when the posture of the vehicle seat **S1** is maintained in the sitting posture. The seat cushion flip-up mechanism **60** and the striker locking mechanism **100** will be described in detail later.

The seatback **20** is formed by providing the seatback frame **21** illustrated in FIG. 5 therein, piling urethane as a cushion material in the seatback frame **21**, and covering the seatback frame by a surface material. The seatback frame **21** of the seatback **20** includes a plate shaped pan frame **22** which forms the base portion of the seatback frame **21** and a pipe frame **23** which forms the outer frame of the seatback frame **21**. The pan frame **22** is molded by performing a process such as beading for ensuring rigidity on a substantially rectangular metal sheet. Then, the headrest rotating mechanism **50** or the arranging unit **80** to be described later is attached to the front surface of the pan frame **22**.

The pipe frame **23** is located at the front side of the pan frame **22**, is disposed along the outer edge of the pan frame **22** to surround the pan frame **22**, and is bonded to the pan frame **22** by welding. Furthermore, in the pipe frame **23**, a position located at the lower portion of the seatback **20** in the up and down direction and a position facing the outside of the vehicle **1** in the right and left direction are disposed to form a gap with respect to the pan frame **22** in the thickness direction of the seatback **20**. The reason why such a gap is formed is because, for example, the end of the urethane as the cushion material piled on the seatback frame **21** is sandwiched between the pan frame **22** and the pipe frame **23**.

Further, in the upper end of the seatback frame **21**, a portion located at the rear side of a pillar **33** to be described later is provided with a pillar folding regulating portion **25** which is formed by a downward U-shaped bracket. The pillar folding regulating portion **25** corresponds to a regulating portion which regulates the rearward rotating (folding) movement of the pillar **33** when the headrest **30** is located at the sitting position. Furthermore, the pillar folding regulating portion **25**

is provided for each pillar **33** (that is, two pillars), and is welded to the upper end portion of the pipe frame **23**.

The seatback **20** with the above-described configuration fits a rotation shaft **20b** into a hole portion of a seatback supporting unit **90** (for example, see FIG. **12**) fixed to the vehicle body floor **2**, and is rotatably supported by the seatback supporting unit **90**. Accordingly, the seatback **20** is rotatable in the front to back direction with respect to the vehicle body floor **2**, and is movable between the sitting position and the folding position. Furthermore, in this embodiment, the seatback **20** is folded forward along with the flip-up operation of the seat cushion **10**. Further, only the seatback **20** may be independently folded forward.

The headrest **30** is provided above the seatback **20** (in other words, the seatback frame **21**), and is formed by charging a foaming material between the surface material and the inverse U-shaped inner frame **31** illustrated in FIG. **6**. Leg portions **31a** which are located at both sides of the inverse U-shaped inner frame **31** are hollow, and each leg portion **31a** is provided with a space for accommodating the hollow guide **32**. The guide **32** is accommodated inside the leg portion **31a**, and is movable forward and backward through an insertion hole (not illustrated) formed in a lower end flange portion **31b** of the leg portion **31a** of the inner frame **31**. Furthermore, the surface material of the headrest **30** is provided with a guide hole (not illustrated) which is formed so that the end of the guide **32** is located at the outside of the surface material.

In the headrest **30** with the above-described configuration, a portion in the periphery of the guide hole in the surface material of the headrest **30** is sandwiched between the lower end flange portion **31b** of the leg portion **31a** of the inner frame **31** and a lower end flange **32a** of the guide **32** in a state where the guide **32** is located at the farthest refracted position inside the leg portion **31a** of the inner frame **31** (a state where the guide is accommodated inside the leg portion **31a** except for the lower end flange **32a**).

Further, in this embodiment, the headrest **30** is supported by the pillars **33** while the pair of pillars **33** (see FIG. **5**) formed by metal bars is inserted into the guides **32**, and the respective pillars **33** are rotatably supported by a casing **51** of the headrest rotating mechanism **50** to be described later.

Then, the headrest **30** may be rotated by the headrest rotating mechanism **50** until the headrest is folded forward by about 90° from the state where the headrest stands above the seatback **20**. Furthermore, in this embodiment, the headrest **30** is rotated to be folded forward along with the flip-up operation of the seat cushion **10**. Further, only the headrest **30** may be folded forward.

Headrest Rotating Mechanism

Next, the headrest rotating mechanism **50** will be described.

The headrest rotating mechanism **50** is a folding mechanism which folds the headrest **30** forward by rotating the pillars **33** forward. The headrest rotating mechanism **50** is attached to the front upper portion of the seatback frame **21** while being covered by a resinous cover (not illustrated).

As illustrated in FIGS. **7** to **9**, the headrest rotating mechanism **50** includes the casing **51**, a biasing spring **52**, a locking member **53**, and a slide member **54**.

The casing **51** is an example of a support portion that forms the casing of the headrest rotating mechanism **50**, and is obtained by multi-plying substantially rectangular metal plates in this embodiment. The casing **51** accommodates the locking member **53** or the slide member **54** therein, and its upper portion rotatably supports the pillar **33**.

Then, in this embodiment, the casing **51** is attached to the front surface of the pan frame **22**, and more specifically, is

located between the rear end of the pan frame **22** and the front end of the pipe frame **23** in the front to back direction of the seatback frame **21** (a direction corresponding to the thickness direction of the seatback **20**). In this way, since the casing **51** is fitted between the rear end of the pan frame **22** and the front end of the pipe frame **23**, the vehicle seat **S1** (particularly, the seatback **20**) may be decreased in size. Here, the rear end of the pan frame **22** indicates the rearmost portion in the rear surface (the back surface) of the pan frame **22** in the front to back direction of the seatback frame **21**. Further, the front end of the pipe frame **23** indicates the frontmost portion in the outer surface of the pipe frame **23** in the front to back direction.

The biasing spring **52** is an example of a biasing member that biases each pillar **33** forward, and is provided at the rear surface (the back surface) of the casing **51**. The locking member **53** is a metallic piece member that engages with each pillar **33** to hold the pillar **33** in a standing state against the biasing force of the biasing spring **52**. Here, the standing state indicates the arrangement state of the pillars **33** when the headrest **30** stands up to be located above the seatback **20** (in other words, a state where the headrest **30** is located at the sitting position).

The configuration of the locking member **53** will be described in more detail. As illustrated in FIGS. **8** and **9**, each pillar **33** includes a vertical portion **33a** which extends along the height direction of the vehicle seat **S1** (in other words, the height direction of the seatback **20**), a horizontal portion **33b** which is adjacent to the lower portion of the vertical portion **33a** and extends in the right and left direction (in other words, the width direction of the seatback **20**), and a substantially fan shaped pillar side engagement portion **33c** which is provided in the end of the horizontal portion **33b**. Then, since the locking member **53** is fitted to a notch **33d** formed in the pillar side engagement portion **33c**, the locking member engages with the pillar **33** to hold the pillar **33** in the standing state.

Further, the locking member **53** is supported inside the casing **51** in a swingable manner, and moves between a position (engagement position) in which a part of the locking member is exposed to the outside of the casing **51** to be fittable to the notch **33d** of the pillar side engagement portion **33c** and a position (release position) in which the exposed portion of the locking member is received in the casing **51** to be separated from the notch **33d**.

The slide member **54** is an elongated member (specifically, a ratchet lever) that is accommodated inside the casing **51**, and slides along the width direction of the seatback **20** to swing the locking member **53**. In a normal state, the slide member **54** is located at a position which causes the locking member **53** to reach the engagement position. Then, when the slide member **54** slides toward one end in the front to back direction, the locking member **53** reaches the release position.

In the headrest rotating mechanism **50** with the above-described configuration, the pillar **33** is held in the standing state against the biasing force of the biasing spring **52** while the locking member **53** engages with the pillar side engagement portion **33c** of the pillar **33** at the engagement position so that the headrest **30** is held at the sitting position.

When the locking member **53** swings from the engagement position to the release position by the sliding movement of the slide member **54**, the engagement between the locking member **53** and the pillar side engagement portion **33c** is released, the pillar **33** rotates forward by the biasing force of the biasing spring **52** so that the headrest **30** is folded forward. The series of operations are operations for folding the headrest **30** forward, and correspond to the folding operations.

In this embodiment, two paths for applying a driving force to the slide member **54** to slide the slide member are prepared. One path is a path which receives an operation performed by a passenger to independently fold only the headrest **30** forward and directly transmits the operation to the slide member **54** to slide the slide member.

Specifically, the vehicle seat **S1** according to this embodiment is provided with a belt shaped member **ST1** that receives the operation performed by the passenger to independently fold only the headrest **30** forward. The belt shaped member **ST1** corresponds to a first receiving portion, and extends from the upper end surface of the seatback **20** along the guide hole provided in the upper end surface of the seatback **20** (see FIG. 2). Then, the passenger pulls the belt shaped member **ST1** along the height direction of the seatback **20** when independently folding only the headrest **30** forward. That is, in this embodiment, the pulling operation for pulling the belt shaped member **ST1** along the height direction of the seatback **20** corresponds to the first operation which is performed by the passenger when independently folding only the headrest **30** forward.

Furthermore, in this embodiment, the belt shaped member **ST1** extends from the portion located at the outside of the vehicle **1** in relation to the headrest **30** in the width direction of the seatback **20** in the upper end surface of the seatback **20** (see FIG. 2). In this way, since the belt shaped member **ST1** extends from a position which may be easily seen by the passenger, the passenger may easily reach the belt shaped member **ST1** and easily perform the operation of pulling the belt shaped member **ST1**. Further, in this embodiment, since the belt shaped member **ST1** extends from the side position of the headrest **30**, the passenger may easily recognize the belt shaped member **ST1** as a member that is operated to fold the headrest **30** forward. By the above-described result, the vehicle seat **S1** with excellent operability may be realized.

The extension position of the belt shaped member **ST1** will be further described. In this embodiment, the belt shaped member **ST1** extends from a position between the headrest **30** and the operation unit **77** (specifically, an operation cover **77a** and an operation lever **77b**) in the width direction of the seatback **20** on the upper end surface of the seatback **20**. Here, the periphery of the operation unit **77** in the seatback **20** has high rigidity. For this reason, when the belt shaped member **ST1** extends from the periphery, the operation of pulling the belt shaped member **ST1** is stably performed.

The belt shaped member **ST1** is fastened to one longitudinal end **54a** of the slide member **54**. Here, one longitudinal end **54a** of the slide member **54** corresponds to a fastening portion which is formed in the slide member **54** to fasten the belt shaped member **ST1** and the slide member **54** to each other.

Further, the belt shaped member **ST1** may be bent at a substantially right angle by abutting against a hooking rod **24** attached to the seatback frame **21** at the halfway position of the extension range. Here, the hooking rod **24** is formed by a linear member, such as a wire, and corresponds to a bending member which abuts against the belt shaped member **ST1** to bend the belt shaped member **ST1**. Then, when the hooking rod **24** bends the belt shaped member **ST1** at a substantially right angle at the halfway position thereof, the movement direction of the belt shaped member **ST1** is switched from the height direction of the seatback **20** to the width direction of the seatback **20**.

That is, the hooking rod **24** corresponds to a converting portion which converts the pulling operation of pulling the belt shaped member **ST1** along the height direction of the

seatback **20** into the sliding movement of the slide member **54** along the width direction of the seatback **20**.

Further, the hooking rod **24** according to this embodiment abuts against the belt shaped member **ST1** so that the belt shaped member **ST1** is bent at the front side in relation to the front end of the pipe frame **23** in the front to back direction of the seatback frame **21**. Accordingly, the operability of the belt shaped member **ST1** is improved by suppressing the contact of the belt shaped member **ST1** with respect to the pipe frame **23**. That is, when the belt shaped member **ST1** contacts the pipe frame **23**, the belt shaped member **ST1** rubs the surface of the pipe frame **23**. For this reason, abnormal noise is generated or the belt shaped member **ST1** is not easily pulled due to the friction. However, since the contact between the belt shaped member **ST1** and the pipe frame **23** is suppressed, these problems may be prevented.

Furthermore, in order to prevent the contact between the belt shaped member **ST1** and the pipe frame **23**, an abutting member **28** that abuts against the belt shaped member **ST1** at the front side of the pipe frame **23** as in the hooking rod **24** is disposed in the periphery of the portion where the belt shaped member **ST1** protrudes from the upper end surface of the seatback **20** in the seatback **20**. Then, the belt shaped member **ST1** abuts against the abutting member **28** at the front side of the pipe frame **23**, and extends from the upper end surface of the seatback **20**.

In the above-described configuration, when the passenger pulls the belt shaped member **ST1** along the height direction of the seatback **20**, the movement direction of the belt shaped member **ST1** is switched to the width direction of the seatback **20** by the operation of the hooking rod **24**. Then, when the belt shaped member **ST1** moves along the width direction, the slide member **54** of which one longitudinal end **54a** is fastened to the belt shaped member **ST1** slides in the same direction so that the locking member **53** swings to the release position. As a result, only the headrest **30** is independently folded forward while the seat cushion **10** and the seatback **20** are held at the sitting position.

As described above, the vehicle seat **S1** according to this embodiment is provided with a first driving portion **140** which drives only the headrest rotating mechanism **50** by the pulling operation received by the belt shaped member **ST1** and permits the headrest rotating mechanism **50** to perform a folding operation.

Specifically, the first driving portion **140** mainly includes one longitudinal end **54a** of the slide member **54** as the fastening portion and the hooking rod **24** as the bending member. Then, the first driving portion **140** transmits the operation of pulling the belt shaped member **ST1** only to the headrest rotating mechanism **50** through the hooking rod **24** and one longitudinal end **54a** of the slide member **54**, and drives only the headrest rotating mechanism **50** by using the pulling operation as a driving force.

As the other path which applies a driving force to the slide member **54** to slide the slide member, the path receives an operation (hereinafter, referred to as a storing operation) performed by the passenger when storing the vehicle seat **S1** and transmits the operation to the slide member **54** of the headrest rotating mechanism **50**. That is, this path is devised as a part of the operation of storing the vehicle seat **S1**, and transmits the storing operation to the slide member **54** to slide the slide member **54** so that the headrest **30** is folded forward.

Specifically, a storing operation belt shaped member **ST2** (see FIG. 11) is provided which receives the operation (storing operation) performed by the passenger to store the vehicle seat **S1**. The storing operation belt shaped member **ST2** corresponds to a second receiving portion, and is fastened to the

11

seat cushion flip-up mechanism **60** to be described later. Then, the passenger pulls the storing operation belt shaped member **ST2** toward the outside of the vehicle **1** when storing the vehicle seat **S1**. That is, in this embodiment, the operation of pulling the storing operation belt shaped member **ST2** toward the outside of the vehicle **1** corresponds to the storing operation, that is, a second operation which is performed by the passenger when storing the vehicle seat **S1**.

Furthermore, the storing operation belt shaped member **ST2** extends from the lateral side toward outside of the vehicle **1** in the vehicle seat **S1**, and is located at the lower portion of the seat cushion **10** when the posture of the vehicle seat **S1** is held in the sitting posture.

Then, when the storing operation belt shaped member **ST2** receives the storing operation performed by the passenger (the passenger pulls the storing operation belt shaped member **ST2** toward the outside of the vehicle **1**), the seat cushion flip-up mechanism **60** first performs an operation (hereinafter, a flip-up operation) in which the seat cushion **10** flips up by the storing operation to move to the flip-up position.

One end of a cable **C** is attached to the seat cushion flip-up mechanism **60** (more specifically, a link **121** of a movable unit **120** to be described later), and the other end of the cable **C** is attached to the arranging unit **80** to be described later. Further, the other cable **C** extends from the arranging unit **80**, and its front end is locked to a side wall of an extension portion **54b** extending in a direction intersecting the front to back direction at the other end side of the slide member **54** in the front to back direction (the side opposite to the fastening side of the belt shaped member **ST1**). Here, the extension portion **54b** corresponds to a connection portion which is formed in the slide member **54** to connect the seat cushion flip-up mechanism **60** and the slide member **54** to each other.

More specifically, in this embodiment, the seat cushion flip-up mechanism **60** and the arranging unit **80** are connected to each other by the cable **C**, and the arranging unit **80** and the extension portion **54b** are connected to each other by the other cable **C**. Thus, the seat cushion flip-up mechanism **60** and the slide member **54** are connected to each other by the extension portion **54b** through the arranging unit **80** and the cable **C**.

Furthermore, in this embodiment, one longitudinal end **54a** of the slide member **54** is nearer than the extension portion **54b** formed at the other end in the front to back direction when viewed from the belt shaped member **ST1**, (for example, see FIGS. **7** and **8**). In other words, in this embodiment, one longitudinal end **54a** of the slide member **54** is located near the belt shaped member **ST1** in relation to the extension portion **54b**. Accordingly, the positional relation between the belt shaped member **ST1** and the slide member **54** becomes appropriate, and hence the assembling workability of the vehicle seat **S1** is further improved.

Specifically, when the operation (operability) of the belt shaped member **ST1** with respect to the slide member **54** is considered, it is preferable that the fastening position between the belt shaped member **ST1** and the slide member **54** is extremely near the belt shaped member **ST1**. For this reason, when the belt shaped member **ST1** is fastened to one longitudinal end **54a** of the slide member **54** which is very near the belt shaped member **ST1**, the length of the belt shaped member **ST1** may be shortened, and hence the assembling workability of the vehicle seat **S1** is further improved.

In the above-described configuration, when the flip-up operation is performed by the seat cushion flip-up mechanism **60**, the operation is transmitted to the arranging unit **80** through the cable **C**. In the arranging unit **80** to which the flip-up operation is transmitted, the respective operation portions (specifically, a first rotating member **83** and a second

12

rotating member **84** to be described later) are operated. Accordingly, the cable **C**, which is locked to the extension portion **54b** formed in the slide member **54** of the headrest rotating mechanism **50**, is pulled, and the slide member **54** slides by the operation of pulling the cable **C** so that the locking member **53** swings to the release position.

As will be described later, the seatback folding mechanism **70** is also operated in addition to the headrest rotating mechanism **50** by the operation of respective operation portions of the arranging unit **80**. As a result, the seat cushion **10** and the seatback **20** respectively move toward the folding position so that the posture of the vehicle seat **S1** is switched from the sitting posture to the storing posture.

As described above, the vehicle seat **S1** according to this embodiment is provided with the second driving portion **150**. Then, when the storing operation belt shaped member **ST2** receives the storing operation, the second driving portion **150** drives the headrest rotating mechanism **50** along with the flip-up operation (that is, the movement of the seat cushion **10** to the flip-up position) of the seat cushion flip-up mechanism **60** so that the folding operation of the headrest rotating mechanism **50** is performed.

Specifically, the second driving portion **150** includes the extension portion **54b** which is formed to connect the seat cushion flip-up mechanism **60** to the slide member **54** of the headrest rotating mechanism **50**, the cable **C** (more specifically, a first cable **C1** and a second cable **C2** to be described later) which is provided between the seat cushion flip-up mechanism **60** and the slide member **54**, and the arranging unit **80** to be described later. Then, when the passenger pulls the storing operation belt shaped member **ST2** toward the outside of the vehicle **1**, the seat cushion flip-up mechanism **60** is operated, the seat cushion **10** flips up toward the flip-up position, and the flip-up operation performed by the seat cushion flip-up mechanism **60** is transmitted to the slide member **54** through the cable **C** and the arranging unit **80**.

More specifically, the cable **C** attached to the seat cushion flip-up mechanism **60** is pulled with the flip-up operation, and the arranging unit **80** is operated by the operation of pulling the cable **C**. Accordingly, the other cable **C** (that is, the cable **C** of which one end is locked to the extension portion **54b** of the slide member **54**) which extends from the arranging unit **80** to the headrest rotating mechanism **50** is pulled. As a result, the slide member **54** slides, and finally, the locking member **53** swings toward the release position. By the above-described series of movement, the second driving portion **150** folds the headrest **30** forward as a part of the operation of storing the vehicle seat **S1**.

Furthermore, in this embodiment, the arranging unit **80** as the relay mechanism is provided between the seat cushion flip-up mechanism **60** and the headrest rotating mechanism **50**. That is, in this embodiment, the seat cushion flip-up mechanism **60** and the headrest rotating mechanism **50** are connected to each other through the arranging unit **80** instead of connecting the seat cushion flip-up mechanism **60** and the headrest rotating mechanism **50** to each other by one cable **C**. In this way, since the seat cushion flip-up mechanism **60** and the headrest rotating mechanism **50** are connected to each other by a plurality of cables **C**, it is possible to shorten the length of each cable **C** and hence to easily replace the cable when the cable is cut.

Next, the attachment of the headrest rotating mechanism **50** will be described. As described above, the headrest rotating mechanism **50** is attached to the upper portion of the seatback frame **21**. Particularly, in this embodiment, the headrest rotating mechanism is attached to the front side of the seatback frame **21** by a stud bolt **Bs**.

13

More specifically, in this embodiment, the respective components of the headrest rotating mechanism 50 are not individually attached, but are attached to the seatback frame 21 while being integrated as a unit. Furthermore, the headrest rotating mechanism 50 is attached to the seatback frame 21 while being assembled to the pillar 33.

Here, in this embodiment, the attachment stud bolt Bs is set to the front side of the seatback frame 21 in advance in the previous step of the attachment of the headrest rotating mechanism 50. The upper and lower portions of the casing 51 of the headrest rotating mechanism 50 are provided with bolt receiving portions 51a which protrude outward. Then, when attaching the headrest rotating mechanism 50 to the seatback frame 21, the headrest rotating mechanism 50 is attached from the front side of the seatback frame 21 through the stud bolt Bs to the bolt hole formed in the bolt receiving portion 51a. In this way, in this embodiment, the headrest rotating mechanism 50 may be attached as one unit, and may be attached from the front side of the seatback frame 21. Accordingly, the headrest rotating mechanism 50 may be easily attached, and hence the assembling workability is improved.

Furthermore, in this embodiment, the installation positions of the bolt receiving portions 51a (in other words, the positions of fixing the headrest rotating mechanism 50 to the seatback frame 21) are three positions. Specifically, the bolt receiving portions are provided at two positions on the upper side of the casing 51 of the headrest rotating mechanism 50, and are provided at one position on the lower side of the casing 51. Here, the stud bolts Bs, which are received by the bolt receiving portions 51a provided on the upper side of the casing 51 of the headrest rotating mechanism 50, are provided in the pillar folding regulating portion 25. That is, in this embodiment, the headrest rotating mechanism 50 is fixed to the pillar folding regulating portion 25.

More specifically, the upper portion of the seatback frame 21 is provided with the pillar folding regulating portion 25 for each pillar 33, and the stud bolt Bs is set to the front surface of each pillar folding regulating portion 25 to slightly protrude from the front surface. When the stud bolt Bs passes through the bolt hole of the bolt receiving portion 51a provided on the upper side of the casing 51 of the headrest rotating mechanism 50 and the casing 51 is attached to each pillar folding regulating portion 25 by the stud bolt Bs, the headrest rotating mechanism 50 is fixed to each pillar folding regulating portion 25.

In this way, in this embodiment, the headrest rotating mechanism 50 is fixed by effectively using the installation space of the pillar folding regulating portion 25. Accordingly, the vehicle seat S1 may be decreased in size. More specifically, the respective pillar folding regulating portions 25 are located at the inside in relation to both ends of the casing 51 of the headrest rotating mechanism 50 in the right and left direction (the width direction of the seatback 20). In this way, since the fixing position of the headrest rotating mechanism 50 is provided in the pillar folding regulating portions 25 located at the inside in relation to both ends of the casing 51 of the headrest rotating mechanism 50, it is possible to further decrease the size of the vehicle seat S1 compared to a case where the fixing positions are provided at the outside in relation to both ends of the casing 51 of the headrest rotating mechanism 50.

Further, the pillar 33 includes the vertical portion 33a which extends in the up and down direction of the seatback frame 21, where the center portion of the front surface of the pillar folding regulating portion 25 is located at the position of the vertical portion 33a in the width direction of the seatback 20, and the stud bolt Bs is set to such a position. That is, in this

14

embodiment, the stud bolt Bs exists on the axis of the vertical portion 33a of the pillar 33. Accordingly, the vehicle seat S1 may be further decreased in size. Specifically, since a region allocated for the arrangement of the pillar 33 (particularly, the vertical portion 33a) in the width direction of the seatback 20 is effectively used to set the stud bolt Bs as a member other than the pillar 33, there is no need to particularly ensure a space for setting the stud bolt Bs, and hence the vehicle seat S1 may be decreased in size.

Further, in the pillar 33, the lower end of the front surface of the pillar folding regulating portion 25 is located at the lower position in the height direction of the seatback 20 in relation to the horizontal portion 33b which is adjacent to the vertical portion 33a and extends in the width direction of the seatback 20, and the stud bolt Bs is set to such a position. Accordingly, the vehicle seat S1 may be further decreased in size. Specifically, an empty space is formed below the bonding position between the vertical portion 33a and the horizontal portion 33b (in other words, the bent position of the pillar 33). When this empty space is used to install the stud bolt Bs, there is no need to separately ensure a space for setting the stud bolt Bs, and hence the vehicle seat S1 may be decreased in size.

The stud bolt Bs which is received by the bolt receiving portion 51a provided at the lower side of the casing 51 of the headrest rotating mechanism 50 is set to the pan frame 22 of the seatback frame 21. Particularly, in this embodiment, the stud bolt Bs is set to a portion overlapping a reinforcing plate 26 in the pan frame 22. In this way, in this embodiment, since the stud bolt Bs is set to the highly rigid portion in the pan frame 22 and the headrest rotating mechanism 50 is fixed by such a stud bolt Bs, the headrest rotating mechanism 50 is appropriately provided, and hence the respective components of the headrest rotating mechanism 50 are stably operated.

Seat Cushion Flip-Up Mechanism

The seat cushion flip-up mechanism 60 is an example of the movement mechanism, and performs the flip-up operation as a start operation for storing the vehicle seat S1 when the storing operation performed by the passenger is received by the storing operation belt shaped member ST2. Here, the flip-up operation indicates the movement operation that flips up the seat cushion 10 to the flip-up position.

Furthermore, in this embodiment, the seat cushion flip-up mechanism 60 is covered by a resin cover (not illustrated), and is provided on the vehicle body floor 2 to be located at the lower position of the seat cushion 10 when the seat cushion 10 is located at the sitting position.

As illustrated in FIGS. 4, 10, and 11, the seat cushion flip-up mechanism 60 includes two components, where one component is an attachment unit 110 which is attached to the vehicle body floor 2, and the other component is a movable unit 120 which is disposed on the attachment unit 110 and swings (rotates) with respect to the attachment unit 110 (in other words, the vehicle body floor 2).

The attachment unit 110 mainly includes an attachment plate 111 which is formed in an L-shape in a top view. In the attachment plate 111, the first plate portion 112 which extends in the front to back direction of the vehicle 1 is fixed to the vehicle body floor 2 by the bolt Bo and the washer Ws fastened in the vehicle body floor 2 (see FIG. 11). Here, the rear end of the first plate portion 112 is provided with an attachment hole 114 formed in an elongated hole shape, and when the bolt Bo and the washer Ws set to the vehicle body floor 2 are fitted to the attachment hole 114, the attachment unit 110 is disposed on the vehicle body floor 2.

Furthermore, the center portion 114b of the attachment hole 114 in the front to back direction has a width that is

15

slightly larger than that of the front end **114a** or the rear end **114c**. When fitting the bolt **Bo** and the washer **Ws** to the attachment hole **114** by using such a configuration, the bolt **Bo** and the washer **Ws** first pass through the center portion **114b** of the attachment hole **114** in the longitudinal direction, and the attachment unit **110** is positioned by displacing the position of the attachment unit **110** so that the bolt **Bo** is fitted to the front end **114a** of the attachment hole **114** in the longitudinal direction.

Further, a locking portion **101** of the striker locking mechanism **100** is attached to the substantial center portion of the first plate portion **112** in the longitudinal direction. The locking portion **101** includes a hook shaped locking piece **102** and a housing **103** which accommodates the locking piece **102** in a swingable state. In a state where the locking piece **102** engages with a striker **105** to be described later, the seat cushion **10** is fixed onto the vehicle body floor **2** at the sitting position. When the locking piece **102** swings, the striker **105** is released from the engagement state with the locking piece **102**, and hence the seat cushion **10** is released from the state where the seat cushion is fixed onto the vehicle body floor **2** to be movable.

Further, one side portion of the first plate portion **112** is provided with an upright wall portion **112a**, and in the upright wall portion **112a**, a slit **112b** through which the storing operation belt shaped member **ST2** passes through is formed at a slightly front position in relation to the attachment position of the locking portion **101**. The storing operation belt shaped member **ST2** which passes through the slit **112b** is disposed on the first plate portion **112** to intersect the first plate portion **112**. Further, one end of the cable **C** is connected to the end of the storing operation belt shaped member **ST2** (the end at the inside of the vehicle **1** when viewed from the first plate portion **112**), and path defining portions **112c** for defining the wiring path when wiring the cable **C** are provided at an appropriate interval in the side portion of the first plate portion **112** (the side portion opposite to the position of the upright wall portion **112a**).

Then, the other end of the cable **C** is connected to a connection piece **104** connected to the locking piece **102**. Accordingly, when the storing operation belt shaped member **ST2** is pulled, the cable **C** pulls the locking piece **102** through the connection piece **104**. As a result, the locking piece **102** swings so that the engagement between the locking piece **102** and the striker **105** is released.

In the attachment plate **111**, a second plate portion **113** which extends along the right and left direction of the vehicle **1** (the width direction of the seatback **20**) is a base portion of the movable unit **120**, and its center portion in the front to back direction is provided with a submarine bracket **115** which prevents a submarine phenomenon in which the passenger sitting on the seat cushion **10** sinks and slides under the waist belt in the event of the collision of the vehicle **1**.

The movable unit **120** has a substantially door structure, and is fixed to the second plate portion **113** of the attachment plate **111** by a bolt. The movable unit **120** includes a pair of links **121**, a pair of pipe rods **122**, a connection bar **123** which connects the links **121** to each other, an attachment bracket **124** for attaching the seat cushion **10**, and a pair of support mechanisms **125** which rotatably support the links **121** and the pipe rods **122**. These components are combined to be integrated as a unit, and are integrally attached as a unit when being attached to the second plate portion **113** of the attachment plate **111**.

The pair of links **121** is an elongated body which is formed by performing a process such as beading on a metal sheet, and is located at both side portions of the movable unit **120**. Each

16

link **121** is rotatably supported in a manner such that a rotation shaft **126A** is fitted to a guide hole (not illustrated) formed in its lower end. Further, the connection bar **123** which connects the links **121** to each other is attached to the upper ends of the respective links **121**. Further, the attachment bracket **124** is attached to the outer surfaces of the upper ends of the respective links **121**. Furthermore, the connection bar **123** and the attachment bracket **124** are attached to the upper ends of the links **121** by a bolt according to a common fastening type.

The pair of pipe rods **122** is disposed in parallel to the links **121**, and is supported to be rotatable in the same direction as the rotation direction of the link **121** in a manner such that a rotation shaft **126B** is fitted to a guide hole (not illustrated) formed in the lower end. Further, the attachment bracket **124** is pinned to the upper end of each pipe rod **122**. Then, in this embodiment, the seat cushion **10** is supported by the pair of links **121** and the pair of pipe rods **122** through the attachment bracket **124**. Further, each pipe rod **122** follows the rotation of the link **121** to rotate in the same direction as the rotation direction of the link **121**.

Further, among the pair of links **121** and the pipe rods **122**, the striker **105** of the striker locking mechanism **100** is attached to the lower surface of the attachment bracket **124** attached to the link **121** and the pipe rod **122** facing the outside of the vehicle **1**. Then, when the link **121** and the pipe rod **122** rotate to fall rearward when viewed from the rotation shafts **126A** and **126B**, the striker **105** reaches a position where the striker may engage with the locking piece **102** of the locking portion **101** provided in the attachment plate **111** (more specifically the first plate portion **112**).

The pair of support mechanisms **125** is used to rotatably support the link **121** and the pipe rod **122**, and includes a base bracket **127** and a damper rubber **129** other than the rotation shafts **126A** and **126B** as illustrated in FIGS. **4**, **10**, and **11**.

The base bracket **127**, which is a metal sheet member that is substantially formed in a Z-shape in a top view, forms the base of the movable unit **120**, and is fixed to the second plate portion **113** of the attachment plate **111** by a bolt. Further, in the base bracket **127**, a portion which extends along the front to back direction of the vehicle **1** becomes an upright wall portion **127a**, and the rotation shafts **126A** and **126B** are attached to the upright wall portion **127a**.

The damper rubber **129** abuts against the front end of the link **121** to absorb an impact generated in the link **121** when the link **121** rotates and reach the forward limit position by the biasing force of the spiral spring **128**. The damper rubber **129** is fixed to the base bracket **127** to be slightly located at the front side of the portion as the rotation support point of the link **121**.

Furthermore, in this embodiment, in order to prevent the cutting of the damper rubber **129** due to the abutting (collision) of the link **121** against the damper rubber **129**, an abutting portion **121a** that is located at a position abutting against the damper rubber **129** in the longitudinal direction of the link **121** is bent, and the front end of the abutting portion **121a** is rounded.

A spiral spring **128** is provided in the support mechanism **125** which is located at the outside of the vehicle **1** in the pair of support mechanisms **125**. The spiral spring **128** is a biasing member that biases the link **121** so that the link falls forward. One end of the spiral spring **128** is locked to the rotation shaft **126A** and the other end thereof is locked to a protrusion portion (not illustrated) protruding from the side surface of the link **121** while the link **121** falls rearward (in other words, before the seat cushion **10** flips up).

With the above-described configuration, the seat cushion **10** is held at the sitting position while receiving the biasing

17

force of the spiral spring 128 through the link 121 (in other words, against the biasing force of the spiral spring 128) when the striker 105 engages with the locking piece 102. When the engagement between the striker 105 and the locking piece 102 is released, the link 121 rotates forward by the biasing force of the spiral spring 128 so that the seat cushion 10 flips up toward the flip-up position.

Furthermore, in the case illustrated in FIGS. 4, 10, and 11, the spiral spring 128 is provided only on one of the pair of links 121, but the present invention is not limited thereto. For example, the spiral spring 128 may be provided for each of both links 121.

Further, in this embodiment, an insertion hole 121b is provided in the course of one link 121 (the link 121 located at the outside of the vehicle 1) in the longitudinal direction, and one end of the cable C is inserted into the insertion hole 121b. The other end of the cable C is connected to the arranging unit 80 (more specifically, the first rotating member 83). Thus, since the link 121 rotates when the seat cushion 10 flips up, the cable C connected to the link 121 is pulled. Finally, the respective components of the arranging unit 80 connected with the cable C are operated by using the pulling force of the cable C. Furthermore, the configuration and the operation of the arranging unit 80 will be described in detail later.

Seatback Folding Mechanism

Next, the seatback folding mechanism 70 will be described.

The seatback folding mechanism 70 is a mechanism that rotates the seatback 20, rotatably supported by the seatback supporting unit 90 illustrated in FIG. 12, so that the seatback is folded forward. The seatback folding mechanism 70 includes a biasing spring 71 illustrated in FIG. 12 and the locking mechanism 72 illustrated in FIG. 13.

The biasing spring 71 is used to bias the seatback 20 located at the sitting position forward, and is specifically a spiral spring which is provided in the seatback supporting unit 90. One end 71a of the biasing spring 71 is locked to the rotation shaft 20b of the seatback 20, and the other end 71b of the biasing spring 71 is locked to a locking pin 91 provided in the seatback supporting unit 90 in a protruding manner.

The locking mechanism 72 is attached to the side portion facing the outside of the vehicle 1 in the seatback frame 21 through a bracket (not illustrated). The locking mechanism 72 includes a locking piece 73 which engages with a striker 74 provided in the vehicle body, and holds the seatback 20 at the sitting position against the biasing force of the biasing spring 71 by the engagement between the locking piece 73 and the striker 74. Here, the vehicle body indicates a portion excluding the vehicle seat S1 in the vehicle 1.

The configuration of the locking mechanism 72 will be described in more detail. As illustrated in FIG. 13, the locking mechanism 72 includes the locking piece 73, a base portion 75, and a connection portion 76. As described above, the locking piece 73 is a hook shaped member that engages with the striker 74, and is rotatably supported by the base portion 75. Here, the locking piece 73 rotates about a support shaft (not illustrated) uprightly formed in the base portion 75 to move between a position (engageable position) where the locking piece may engage with the striker 74 and a position (non-engageable position) where the locking piece may not engage with the striker 74.

Furthermore, the locking piece 73 is biased by a torsional spring (not illustrated) in a direction in which the locking piece faces the engageable position in the rotation direction. When the locking piece 73 is rotated from the engageable position to the non-engageable position against the biasing

18

force of the torsional spring, the engagement state between the locking piece 73 and the striker 74 may be released.

The connection portion 76 is formed as an oval metal sheet, and is attached to the base portion 75 to be slidable along the up and down direction. When the locking piece 73 is attached to a lower end 76a (one end) of the connection portion 76 and the connection portion 76 slides upward, the locking piece 73 rotates in a direction facing the non-engageable position. Further, an upper end 76b (the other end) of the connection portion 76 is connected with a connecting rod 77c of the operation unit 77 to be described later and the cable C extending from the arranging unit 80.

In the seatback folding mechanism 70 with the above-described configuration, when the locking piece 73 engages with the striker 74, the seatback 20 is held at the sitting position against the biasing force of the biasing spring 71. When the locking piece 73 rotates from the engageable position toward the non-engageable position in accordance with the upward sliding movement of the connection portion 76, the engagement between the locking piece 73 and the striker 74 is released. For this reason, the seatback 20 rotates about the rotation shaft 20b to be folded forward by the biasing force of the biasing spring 71, and finally reaches the folding position.

Furthermore, in this embodiment, a damper mechanism (not illustrated) is provided in the seatback supporting unit 90, and when the folding angle of the seatback 20 reaches a predetermined angle, the folding speed (rotating speed) gradually decreases by the operation of the damper mechanism. Accordingly, since the seatback 20 reaches the folding position at a gentle speed, it is possible to prevent an accident caused by the collision with the seatback 20 even when the seatback 20 is folded while a person or an object exists between the seatback 20 and the vehicle body floor 2.

In this embodiment, there are prepared two paths that apply a driving force for sliding the connection portion 76 upward to the connection portion (in other words, a driving force for rotating the locking piece 73 toward the non-engageable position). One path is a path that receives an operation performed by the passenger to independently fold only the seatback 20 forward and transmits the operation to the locking piece 73 through the connection portion 76.

Specifically, the upper end of the seatback 20 is provided with the operation unit 77 that receives an operation performed by the passenger to independently fold only the seatback 20 forward. Furthermore, in the upper end surface of the seatback 20, the arrangement position of the operation unit 77 is located at the outside of the vehicle 1 in relation to the belt shaped member ST1 when viewed from the headrest 30 (see FIG. 2). As illustrated in FIG. 13, the operation unit 77 includes the operation cover 77a and the operation lever 77b which is rotatably supported by the operation cover 77a. The operation cover 77a has a concave shape in which the operation lever 77b may be accommodated. Then, the operation cover 77a is fixed to the seatback 20 while its flange abuts against the upper end surface of the seatback 20. More specifically, the operation cover is fixed to the attachment bracket 27 (see FIG. 5) provided at the shoulder position of the seatback frame 21.

The operation lever 77b is biased in a direction (specifically, a direction facing forward inside the operation cover 77a) in which the operation lever is accommodated inside the operation cover 77a in the rotation direction of the operation lever 77b by a biasing mechanism (not illustrated). Further, the connecting rod 77c which is formed by a metal member substantially formed in a zigzag shape is connected to a predetermined position of the operation lever 77b. The con-

necting rod 77c moves upward along with the upward rotation of the operation lever 77b (specifically, the rearward rotation of the operation lever 77b inside the operation cover 77a).

In the operation unit 77 with the above-described configuration, when the passenger rotates the operation lever 77b upward, the connecting rod 77c moves upward so that the above-described operation is transmitted to the connection portion 76 as a driving force for sliding the connection portion 76 upward. Finally, the upward sliding movement of the connection portion 76 is transmitted to the locking piece 73, and the locking piece 73 rotates toward the non-engageable position against the biasing force of the torsional spring. Accordingly, the engagement state of the locking piece 73 which engages with the striker 74 so far is released. As a result, the seatback 20 rotates to be independently folded forward by receiving the biasing force of the biasing spring 71. As described above, when the passenger rotates the operation lever 77b upward, the seatback 20 is independently folded forward.

Furthermore, when the engagement between the locking piece 73 and the striker 74 is released, the locking piece 73 is maintained in a state where the engagement with the striker 74 may not be performed until the locking piece rotates in the opposite direction to return to the engageable position.

The other path which applies a driving force for sliding the connection portion 76 is a path which receives an operation performed by the passenger to store the vehicle seat S1 and transmits the operation to the connection portion 76. That is, this path is used to transmit such an operation for flipping up the seat cushion 10 to the flip-up position when storing the vehicle seat S1 to the connection portion 76.

Specifically, as described in the section of the headrest rotating mechanism, the vehicle seat S1 is provided with the storing operation belt shaped member ST2 which receives the operation of storing the vehicle seat S1. One end of the cable C is attached to the seat cushion flip-up mechanism 60 (more specifically, the link 121 of the movable unit 120), and the other end of the cable C is attached to the arranging unit 80 to be described later. Further, the other cable C extends from the arranging unit 80, and its front end is connected to the upper end 76b of the connection portion 76.

Under the above-described configuration, when the passenger pulls the storing operation belt shaped member ST2, the seat cushion flip-up mechanism 60 is operated, and the seat cushion 10 flips up toward the flip-up position. Then, the flip-up operation is transmitted to the connection portion 76 through the cable C and the arranging unit 80. Specifically, when the flip-up operation is performed by the seat cushion flip-up mechanism 60, the cable C attached to the seat cushion flip-up mechanism 60 is pulled, and the arranging unit 80 is operated by the operation of pulling the cable C so that the cable C locked to the upper end 76b of the connection portion 76 is pulled by the operation of the arranging unit 80.

By the above-described series of operations, finally, the connection portion 76 slides upward, and the locking piece 73 rotates toward the non-engageable position. Then, as in the case of the operation unit 77, the engagement state of the locking piece 73 engaging with the striker 74 so far is released, and the seatback 20 is folded forward to rotate to the position of the seat cushion 10 before the flip-up operation. Then, the locking piece 73 rotates in the opposite direction, and is maintained in a state where the locking piece may not engage with the striker 74 until the locking piece returns to the engageable position.

Arranging Unit

Next, the arranging unit 80 will be described.

The arranging unit 80 is a device which interlocks the operation for folding the seatback 20 forward and the operation for folding the headrest 30 forward with the operation of flipping up the seat cushion 10 when storing the vehicle seat S1.

Specifically, the arranging unit 80 is operated to swing the locking member 53 of the headrest rotating mechanism 50 toward the release position and rotate the locking piece 73 of the seatback folding mechanism 70 toward the non-engageable position by using a driving force as an operation of rotating the link 121 of the seat cushion flip-up mechanism 60 as the operation performed to flip up the seat cushion 10. In other words, the arranging unit 80 is a device which transmits the operation of rotating the link 121 of the seat cushion flip-up mechanism 60 to the headrest rotating mechanism 50 and the seatback folding mechanism 70 to operate these mechanisms.

In order to realize the above-described function, the arranging unit 80 is connected to each of the link 121 of the seat cushion flip-up mechanism 60, the slide member 54 of the headrest rotating mechanism 50, and the connection portion 76 of the seatback folding mechanism 70 through the cable C as the transmitting member. Further, the arranging unit 80 is connected to the folding angle detecting mechanism 130 (the folding angle detecting mechanism 130 will be described later) by the cable C as the transmitting member. That is, four cables C extend from the arranging unit 80.

Furthermore, in the description below, for convenience of description, the cable connected to the link 121 of the seat cushion flip-up mechanism 60 is referred to as a first cable C1, the cable connected to the slide member 54 of the headrest rotating mechanism 50 is referred to as a second cable C2, the cable connected to the connection portion 76 of the seatback folding mechanism 70 is referred to as a third cable C3, and the cable connected to the folding angle detecting mechanism 130 is referred to as a fourth cable C4, in order to distinguish the four cables C extending from the arranging unit 80.

In this embodiment, as illustrated in FIG. 5, the arranging unit 80 is fixed to a portion slightly close to the outside of the vehicle 1 in relation to the center in the width direction of the seatback 20 in the front surface of the pan frame 22 constituting the seatback frame 21 by a bolt. The attachment of the arranging unit 80 will be described later in detail.

The specific configuration of the arranging unit 80 will be described. As illustrated in FIG. 14, the arranging unit 80 mainly includes a casing 81, a rotation shaft 82, a first rotating member 83, a second rotating member 84, a third rotating member 85, an engagement pin 86, a cushioning rubber 87, a first coil spring 88a, a second coil spring 88b, and a third coil spring 88c. Further, as described above, the arranging unit 80 is connected to the seat cushion flip-up mechanism 60 by the first cable C1, is connected to the headrest rotating mechanism 50 by the second cable C2, is connected to the seatback folding mechanism 70 by the third cable C3, and is connected to the folding angle detecting mechanism 130 to be described later by the fourth cable C4. Hereinafter, the respective components will be described.

The casing 81 has a substantially fan shaped outer shape in a top view, and is provided at the front side of the operation portion of the arranging unit 80 (specifically, the first rotating member 83, the second rotating member 84, the third rotating member 85, and the like) to cover the operation portion. Further, the casing 81 includes an attachment hole (not illustrated in FIG. 14) which is formed to attach the rotation shaft 82.

21

Further, a circular-arc guide slit **81b** is formed in a portion close to the outer edge of the casing **81**. The guide slit **81b** serves as a guide portion when the first rotating member **83** rotates, and is formed along the rotation direction of the first rotating member **83**. Furthermore, in this embodiment, a step is formed at the formation position of the guide slit **81b**, and a center region **81c** of the casing **81** adjacent to the guide slit **81b** is slightly recessed to the back side in relation to the outer region **81d** located at the outside in relation to the guide slit **81b** in the thickness direction of the casing **81**.

The rotation shaft **82** is a member that rotatably supports the first rotating member **83** and the second rotating member **84**, and is detachably attached to the casing **81**. Furthermore, in this embodiment, the attachment portion of the rotation shaft **82** in the rear surface of the casing **81** is raised by one level from the periphery thereof, and forms a pedestal (not illustrated) of the rotation shaft **82**. The first rotating member **83** is a metal sheet member that rotates about the rotation shaft **82**, and extends from the rotation shaft **82** toward the guide slit **81b**. One end (the end near the guide slit **81b**) in the extension direction of the first rotating member **83** is provided with a cable locking portion **83a** which locks one end of the first cable **C1** and a tongue shaped portion **83b** which passes through the guide slit **81b** and goes around from the rear surface of the casing **81** to the front surface thereof.

Further, a tongue shaped engagement portion **83c** which extends from the side portion of the first rotating member **83** and engages with the surface of the second rotating member **84** (specifically, the surface of the outermost edge **84d** of the second rotating member **84**) is provided at the halfway position of the first rotating member **83** in the extension direction. Furthermore, the first coil spring **88a** is attached to one end of the first rotating member **83** in the extension direction, and the first coil spring **88a** biases the first rotating member **83** toward one end position in its rotation range (specifically, a position where the first rotating member **83** is normally located).

With the above-described configuration, the first rotating member **83** is normally biased by the first coil spring **88a**, and is located at one end position in its rotation range. When the first cable **C1** is pulled toward the link **121** by the rotation of the link **121** of the seat cushion flip-up mechanism **60**, one end of the first rotating member **83** in the extension direction is pulled through the cable locking portion **83a** so that the first rotating member **83** rotates from one end position toward the other end position in the rotation range against the biasing force of the first coil spring **88a**.

Furthermore, when the first rotating member **83** rotates, the tongue shaped portion **83b** of the first rotating member **83** moves inside the guide slit **81b** along the guide slit **81b**, and the tongue shaped engagement portion **83c** of the first rotating member **83** moves on the surface of the second rotating member **84** along the surface. Accordingly, the first rotating member **83** may appropriately rotate within the set rotation range.

Precisely, the first coil spring **88a** is attached to and the first cable **C1** is connected to a position (specifically, one end in the extension direction) slightly separated from the rotation shaft **82** as a support point in the first rotating member **83**. For this reason, there is a possibility that the first rotating member **83** may be buckled so that its extension direction is curved, and the first rotating member may not easily rotate in the appropriate rotation range when the buckling is generated. In order to prevent such an accident, in this embodiment, the casing **81** is provided with the guide slit **81b**, the tongue shaped portion **83b** of the first rotating member **83** passes through the guide slit **81b**, and the tongue shaped engagement portion **83c** of the first rotating member **83** engages with the outermost edge **84d** of the second rotating member **84** and

22

moves on the surface of the second rotating member **84**. Accordingly, since the buckling of the first rotating member **83** is regulated, the first rotating member may appropriately rotate in the set rotation range.

Furthermore, a portion of the first rotating member **83** located at the halfway position in the extension direction is provided with a protrusion portion **83d** which slightly protrudes more than the other portions. The protrusion portion **83d** is a portion which collides with the cushioning rubber **87** to be described later when the first rotating member **83** returns from the other end position to one end position in the rotation range by the biasing force of the first coil spring **88a**. Further, a circular-arc hole (hereinafter, a circular-arc hole **83e**) is formed at the halfway position of the first rotating member **83** in the extension direction, and the engagement pin **86** to be described later passes through the circular-arc hole **83e**. Furthermore, an attachment hole (not illustrated) for attaching the rotation shaft **85a** of the third rotating member **85** is formed in the vicinity of the circular-arc hole **83e**.

The second rotating member **84** is a substantially fan shaped metal sheet member that overlaps the first rotating member **83** at the opposite side to the casing **81** (the second rotating member overlaps on the first rotating member **83** in the state illustrated in FIG. 14) and rotates about the rotation shaft **82**. The outer edge of the second rotating member **84** is provided with a connection hole **84e** for connecting the ends of the second cable **C2** and the third cable **C3**. Then, when the second rotating member **84** rotates from one end position toward the other end position in its rotation range, the two cables **C** are pulled.

Further, the second coil spring **88b** is attached to the vicinity of the connection position of the second cable **C2** and the third cable **C3** in the outer edge of the second rotating member **84**. The second coil spring **88b** biases the second rotating member **84** toward one end position (specifically, a position where the second rotating member **84** is normally located) in its rotation range.

Further, the second rotating member **84** is provided with a guide hole **84a**, through which the engagement pin **86** to be described later passes, formed along the rotation direction of the second rotating member **84**. The guide hole **84a** has a width sufficiently larger than the outer diameter of the engagement pin **86**. Particularly, the width of the end of the guide hole **84a** located at one end in the rotation direction of the second rotating member **84** is larger than the width of the other portion. That is, in this embodiment, a step is formed at a position close to one end of the guide hole **84a** in the rotation direction of the second rotating member **84**. In other words, a convex portion **84b** which protrudes toward the inside of the guide hole **84a** is formed at one end of the second rotating member **84** in the edge of the guide hole **84a** in the rotation direction of the second rotating member **84**.

The engagement pin **86** is uprightly formed in the third rotating member **85** to be described later, and moves along with the third rotating member **85**. Then, the engagement pin **86** is locked to the convex portion **84b** to engage with the second rotating member **84**, and moves inside the guide hole **84a** while climbing over the convex portion **84b** to release the engagement state with the second rotating member.

The second rotating member **84** with the above-described configuration is normally biased by the second coil spring **88b** to be located at one end position in the rotation range. The engagement pin **86** is located at the side portion of the convex portion **84b** (more specifically, on end side in relation to the convex portion **84b** in the rotation direction of the second rotating member **84**). Then, when the engagement pin **86** moves inside the guide hole **84a** to be locked to the convex

23

portion **84b**, the second rotating member **84** is pressed from one end position toward the other end position in its rotation range by the engagement pin **86**. By the pressing force of the engagement pin **86**, the second rotating member **84** rotates toward the other end position in the rotation range against the biasing force of the second coil spring **88b** so that the second cable **C2** and the third cable **C3** are pulled.

When the engagement pin **86** moves inside the guide hole **84a** to climb over the convex portion **84b**, the engagement between the second rotating member **84** and the engagement pin **86** is released. Accordingly, the second rotating member **84** is released from the pressing by the engagement pin **86** and is biased by the second coil spring **88b** to return to one end position in the rotation range.

Furthermore, a protrusion portion **84c** is formed at a position located at one end of the second rotating member **84** in the rotation direction in the outer edge of the second rotating member **84**. The protrusion portion **84c** is a portion that collides with the cushioning rubber **87** to be described later when the second rotating member **84** returns from the other end position toward one end position in the rotation range by the biasing force of the second coil spring **88b**. Further, in the second rotating member **84**, the outermost edge **84d** farthest from the rotation shaft **82** is formed in a circular-arc shape, and its surface is provided with the tongue shaped engagement portion **83c** of the first rotating member **83**. Then, the tongue shaped engagement portion **83c** engages with the outermost edge **84d** and moves along the surface of the outermost edge **84d**.

The third rotating member **85** is a metal sheet member that is substantially formed in a gourd bowl shape and rotates about the rotation shaft **85a** attached to the first rotating member **83**. The third rotating member **85** overlaps the first rotating member **83** at the position of the casing **81** (the third rotating member overlaps beneath the first rotating member **83** in the state illustrated in FIG. 14), and the columnar engagement pin **86** is uprightly formed on the surface thereof. The engagement pin **86** passes through the circular-arc hole **83e** formed in the first rotating member **83**, and passes through the guide hole **84a** of the second rotating member **84**.

Further, the third coil spring **88c** is attached to one end of the third rotating member **85**. The other end of the third coil spring **88c** is locked to the other end (the end near the position of the rotation shaft **82**) of the first rotating member **83** in the extension direction, and biases the third rotating member **85** so that the outer peripheral surface of the engagement pin **86** abuts against the inner edge of the circular-arc hole **83e**. The third rotating member **85** rotates relative to the first rotating member **83** by the biasing force of the third rotating member **85**, and the outer peripheral surface of the engagement pin **86** is normally pressed against the inner edge of the circular-arc hole **83e**. When the first rotating member **83** rotates in such a state, the third rotating member **85** and the engagement pin **86** rotate along with the first rotating member **83**.

Further, when the third rotating member **85** rotates along with the first rotating member **83** from one end position toward the other end position in the rotation range (in other words, toward the same direction as the direction in which the first rotating member **83** rotates against the biasing force of the first coil spring **88a**), the engagement pin **86** is locked to the convex portion **84b** of the second rotating member **84** and engages with the second rotating member **84** (see FIG. 15B). Accordingly, the engagement pin **86** presses the second rotating member **84** from one end position toward the other end position in the rotation range. That is, in the arranging unit **80** of this embodiment, when the first rotating member **83** rotates while the second rotating member **84** engages with the

24

engagement pin **86**, the engagement pin **86** presses the second rotating member **84** by using the rotation of the first rotating member **83**, and rotates the second rotating member **84** from one end position toward the other end position in the rotation range against the biasing force of the second coil spring **88b**.

The fourth cable **C4** is connected to the front end of the engagement pin **86**, and the fourth cable **C4** is connected to the folding angle detecting mechanism **130** as described above (see FIG. 5). When the seatback **20** is folded forward, the engagement pin **86** is pulled toward the vehicle body floor **2**. Here, the folding angle detecting mechanism **130** includes a locking portion (not illustrated) of which one end is locked to the vehicle body floor **2**, and the other end of the locking portion is fixed to the seatback frame **21**. Then, the folding angle detecting mechanism **130** is a mechanism that pulls the engagement pin **86** toward the vehicle body floor **2** through the fourth cable **C4** along with the operation in which the seatback **20** is folded forward.

The pulling force in which the folding angle detecting mechanism **130** pulls the engagement pin **86** increases with an increase in the folding angle of the seatback **20**, and exceeds the locking force between the engagement pin **86** and the convex portion **84b** of the second rotating member **84** when the folding angle reaches a predetermined angle. In such a state, the third rotating member **85** rotates relative to the first rotating member **83** by the pulling force of the fourth cable **C4** so that the engagement pin **86** climbs over the apex of the convex portion **84b**.

Furthermore, the predetermined angle may be arbitrarily set. For example, the predetermined angle may be set by adjusting the cable length of the fourth cable **C4**, the shape of the convex portion **84b**, and the installation position of the folding angle detecting mechanism **130**.

Then, when the engagement pin **86** climbs over the apex of the convex portion **84b**, the second rotating member **84** is released from the pressing of the engagement pin **86** and is biased by the second coil spring **88b** to return to one end position in the rotation range. Furthermore, when the engagement pin **86** climbs over the apex of the convex portion **84b**, the third rotating member **85** rotates again along with the first rotating member **83**. Accordingly, the engagement pin **86** moves along the inner edge of the guide hole **84a** while facing the opposite side to the position of the convex portion **84b**.

The cushioning rubber **87** is a damper which abuts against the protrusion portion **83d** of the first rotating member **83** or the protrusion portion **84c** of the second rotating member **84** to reduce the impact applied to the respective rotating members when the first rotating member **83** and the second rotating member **84** are biased by the respectively corresponding coil springs **88a** and **88b** to return to one end position in the rotation range (in the normal position). The cushioning rubber **87** is formed in a cylindrical shape, and is supported by a support shaft **87a** uprightly formed on the rear surface of the casing **81**. Furthermore, the cushioning rubber **87** according to this embodiment is formed of a rigid rubber material to suppress a collision sound generated by the collision of the first rotating member **83** and the second rotating member **84**.

The operation examples of the respective components of the arranging unit **80** with the above-described configuration will be described by referring to FIGS. 15A to 15D.

In a normal state (when the posture of the vehicle seat **S1** is maintained in the sitting posture), as illustrated in FIG. 15A, the first rotating member **83**, the second rotating member **84**, and the third rotating member **85** are respectively biased by the corresponding springs of the first coil spring **88a**, the second coil spring **88b**, and the third coil spring **88c** to be located at the initial positions.

25

Here, the initial position of the first rotating member **83** is one end position in the rotation range, and is specifically a position in which the protrusion portion **83d** of the first rotating member **83** abuts against the cushioning rubber **87**. Similarly, the initial position of the second rotating member **84** is one end position in the rotation range and is specifically a position in which the protrusion portion **84c** of the second rotating member **84** abuts against the cushioning rubber **87**. The initial position of the third rotating member **85** is a position in which the engagement pin **86** is pressed against the inner edge of the circular-arc hole **83e** formed in the first rotating member **83** and is disposed at one end side of the second rotating member **84** in the rotation direction in the guide hole **84a** formed in the second rotating member **84**.

If the flip-up operation using the seat cushion flip-up mechanism **60** is performed when the respective rotating members **83**, **84**, and **85** are present at the respective initial positions, the first cable **C1** is pulled toward the link **121** by the rotation of the link **121** connected with the first cable **C1**. As a result, the first rotating member **83** rotates toward the other end position in the rotation range against the biasing force of the first coil spring **88a**. At this time, since the engagement pin **86** is pressed against the inner edge of the circular-arc hole **83e** of the first rotating member **83**, the third rotating member **85** rotates along with the first rotating member **83**.

When the third rotating member **85** rotates along with the first rotating member **83**, the engagement pin **86** moves inside the guide hole **84a** formed in the second rotating member **84**, and is locked to the convex portion **84b** to engage with the second rotating member **84** as illustrated in FIG. 15B. Then, when the first rotating member **83** rotates further toward the other end position in the rotation range, the engagement pin **86** presses the second rotating member **84**. The second rotating member **84** rotates from one end position toward the other end position in the rotation range against the biasing force of the second coil spring **88b** by the pressing force of the engagement pin **86**. The second cable **C2** and the third cable **C3** are pulled by the second rotating member **84**.

When the third cable **C3** is pulled, the locking piece **73** of the locking mechanism **72** rotates to the non-engageable position as described above so that the engagement state between the locking piece **73** and the striker **74** is released. As a result, the seatback **20** is folded forward by receiving the biasing force of the biasing spring **71**. When the seatback **20** is folded forward, the fourth cable **C4** connected to the engagement pin **86** is pulled toward the vehicle body floor **2** by the folding angle detecting mechanism **130**, and the pulling force gradually increases with an increase in the folding angle of the seatback **20**.

Then, when the folding angle of the seatback **20** reaches a predetermined angle, the pulling force acting on the engagement pin **86** exceeds the locking force of the engagement pin **86** and the convex portion **84b** of the second rotating member **84**. In such a state, the third rotating member **85** rotates relative to the first rotating member **83** against the biasing force of the third coil spring **88c** by the pulling force of the fourth cable **C4**. By the relative rotation of the third rotating member **85**, the engagement pin **86** climbs over the apex of the convex portion **84b** as illustrated in FIG. 15C. Accordingly, the engagement state between the engagement pin **86** and the second rotating member **84** is released, and the second rotating member **84** returns to one end position (that is, the initial position) in the rotation range by the biasing force of the second coil spring **88b**.

Furthermore, the third rotating member **85** rotates again along with the first rotating member **83** after the engagement

26

pin **86** climbs over the apex of the convex portion **84b**. Accordingly, the engagement pin **86** moves along the inner edge of the guide hole **84a** formed in the second rotating member **84** while facing the opposite side to the position of the convex portion **84b** (see FIG. 15D).

When the second rotating member **84** returns to one end position in the rotation range, the pulling of the second cable **C2** and the third cable **C3** by the second rotating member **84** is released. Accordingly, the locking piece **73** of the locking mechanism **72** rotates to return from the non-engageable position to the engageable position.

That is, in this embodiment, since the engagement pin **86** is continuously locked to the convex portion **84b** of the second rotating member **84** until the seatback **20** is folded forward and the folding angle reaches a predetermined angle, the second rotating member **84** continuously pulls the third cable **C3** so that the locking piece **73** connected to the third cable **C3** stays at the non-engageable position. That is, since the locking piece **73** is located at the non-engageable position even when the passenger performs an operation of raising the seatback **20** until the seatback **20** is folded forward and the folding angle reaches a predetermined angle, the locking piece **73** may not engage with the striker **74** to fix the seatback **20** to the sitting position again.

When the folding angle of the seatback **20** reaches a predetermined angle and the engagement pin **86** climbs over the convex portion **84b**, the engagement between the engagement pin **86** and the second rotating member **84** is released so that the second rotating member **84** returns to one end position in the rotation range. Accordingly, the second rotating member **84** does not pull the third cable **C3** later so that the locking piece **73** connected to the third cable **C3** is located at the engageable position again. That is, when the passenger performs an operation of raising the seatback **20** after the folding angle of the seatback **20** reaches a predetermined angle, the locking piece **73** engages with the striker **74**. Accordingly, the seatback **20** may be fixed (relocked) to the sitting position again.

As described above, in this embodiment, it is possible to perform a returning operation (cancel operation) for returning the seatback **20** of which the engagement with the striker **74** fixed to the vehicle body is released to a state in which the seatback may engage with the striker **74** while performing the operation of storing the vehicle seat **S1** by the above-described configuration. Then, in this embodiment, the returning operation is performed in response to the folding angle when folding the seatback **20** forward. More specifically, the returning operation is performed when the folding angle reaches a predetermined angle.

Next, the attachment of the arranging unit **80** will be described. In this embodiment, the respective components of the arranging unit **80** are not individually attached, but are integrally attached as a unit to the pan frame **22**. Here, the attachment stud bolt **Bs** is attached to the front surface of the pan frame **22** in the previous step of the attachment of the arranging unit **80**. A plurality of bolt receiving portions **81a** are provided in the casing **81** of the arranging unit **80** at an appropriate interval along the outer periphery thereof.

Then, when attaching the arranging unit **80** to the pan frame **22**, the arranging unit **80** is attached from the front surface side of the pan frame **22** to the bolt hole formed in the bolt receiving portion **81a** through the stud bolt **Bs**. In this way, in this embodiment, the arranging unit **80** may be attached as one unit, and may be attached from the front surface side of the pan frame **22**. Accordingly, the arranging unit **80** may be easily attached, and hence the assembling workability is improved.

27

Furthermore, in this embodiment, there are three installation positions of the bolt receiving portion **81a** (in other words, the positions in which the arranging unit **80** is fixed to the pan frame **22**), and the respective installation positions are set to be located at the apexes of the triangle. Here, in the triangular region having the apexes as the installation positions of the bolt receiving portions **81a**, the operations of the members arranged within the region may be stabilized. Accordingly, when the engagement pin **86** is disposed within the region and the movable range of the engagement pin **86** is set within the region, the engagement pin **86** is stably operated.

Further, in this embodiment, one installation position of the bolt receiving portion **81a** is located near the cushioning rubber **87**. In other words, the operation portions (specifically, the first rotating member **83** and the second rotating member **84**) collide with the cushioning rubber **87** in the vicinity of the fixation position of the arranging unit **80**. In this way, since the fixation position of the arranging unit **80** exists in the vicinity of the position where the collision between the members occurs, a variation in the arrangement position of the arranging unit **80** is suppressed even when the collision occurs. Accordingly, the arranging unit **80** may be stably disposed on the pan frame **22**. Furthermore, in order to further effectively exhibit the above-described effect, it is more desirable that the arrangement position of the support shaft **87a** of the cushioning rubber **87** be disposed on the line connecting the collision position between the operation portion and the cushioning rubber **87** to the installation position of the bolt receiving portion **81a**.

Further, in this embodiment, the arranging unit **80** is attached to the substantial center in the up and down direction of the seatback frame **21**. Accordingly, the operation stability of the respective components of the arranging unit **80** is improved.

Specifically, since the belt shaped member **ST1** which receives the operation of independently folding the headrest **30** forward is provided at the upper end of the seatback **20**, the headrest rotating mechanism **50**, which is operated by the operation of pulling the belt shaped member **ST1**, is disposed in the vicinity of the upper end of the seatback **20**. Further, it is desirable to dispose the arranging unit **80**, which is operated to drive the headrest rotating mechanism **50**, in the vicinity of the headrest rotating mechanism **50** (that is, the upper end of the seatback **20**) from the viewpoint of the operation stability. The arranging unit **80** is used to transmit the flip-up operation performed by the seat cushion flip-up mechanism **60** to the headrest rotating mechanism **50** or the seatback folding mechanism **70**. From this viewpoint, it is desirable to dispose the arranging unit in the vicinity of the seat cushion **10** (more precisely, the seat cushion flip-up mechanism **60**), that is, the vicinity of the lower end of the seatback **20**.

Due to the above-described circumstance, in this embodiment, the arranging unit **80** is attached to the middle position of the upper end and the lower end of the seatback frame **21**, and hence the operation stability of the arranging unit **80** is improved.

Further, in this embodiment, from the viewpoint of the improvement in the operation stability, the arranging unit **80** is attached to the position near the outside of the vehicle **1** in the right and left direction (that is, the width direction of the seatback **20**). This improves the operation stability by a configuration in which the end of the first cable **C1** extending from the arranging unit **80** is attached to the link **121** located at the outside of the vehicle **1** among the pair of links **121** provided in the seat cushion flip-up mechanism **60** and the cable length is extremely shortened.

28

The attachment of the arranging unit **80** will be described further. In this embodiment, the reinforcing plate **26** for improving the rigidity of the pan frame **22** is attached to the position slightly close to the upper side in relation to the center of the pan frame **22** in the height direction (corresponding to the height direction of the seatback **20**). Then, the arranging unit **80** is attached to a portion (that is, a portion with improved rigidity) provided with the reinforcing plate **26** in the pan frame **22** so that the arranging unit **80** is partially caught. Specifically, one of the attachment positions of the arranging unit **80** (that is, the installation positions of the bolt receiving portions **81a**) is located on the reinforcing plate **26**.

As described above, the rigidity of the attachment position of the arranging unit **80** is improved. As a result, it is possible to stabilize the operation of the respective operation portions (specifically, the first rotating member **83** or the second rotating member **84**) of the arranging unit **80**. Accordingly, the function of the arranging unit **80** (the function of transmitting the flip-up operation performed by the seat cushion flip-up mechanism **60** to the headrest rotating mechanism **50** or the seatback folding mechanism **70**) is appropriately exhibited.

Furthermore, the reinforcing plate **26** has an elongated rectangular shape along the width direction of the seatback **20**, and one longitudinal end reaches the pipe frame **23** to be bonded to the pipe frame **23**. Accordingly, the reinforcing effect obtained by the reinforcing plate **26** is improved, and hence the rigidity of the attachment position of the arranging unit **80** may be further improved.

Further, in this embodiment, the headrest rotating mechanism **50** is fixed to the pan frame **22** at the upper position of the arranging unit **80**. In this way, since the arranging unit **80** and the headrest rotating mechanism **50** are arranged in parallel in the vertical direction, the rigidity of the pan frame **22** is further improved. In addition, the arranging unit **80** is attached to the pan frame **22** while the upper portion thereof reaches the reinforcing plate **26**, and the headrest rotating mechanism **50** is attached to the pan frame **22** while the lower portion thereof reaches the reinforcing plate **26**. That is, the reinforcing plate **26** is provided at a position sandwiched between the headrest rotating mechanism **50** and the arranging unit **80** in the up and down direction of the seatback frame **21**. Accordingly, the rigidity of the pan frame **22** is further improved.

Next, the wiring path of each cable **C** extending from the arranging unit **80** will be described by referring to FIG. 5.

First, the respective cables **C** are all wired to be located inside the pipe frame **23**. In other words, the shape of the pipe frame **23** and the arrangement position of the pipe frame **23** in the seatback frame **21** are designed to avoid the contact with the cable **C**. Accordingly, abnormal noise caused by the contact between the pipe frame **23** and the cable **C** is prevented.

Hereinafter, the wiring path for the cable **C** will be described in detail.

Among the cables **C** extending from the arranging unit **80**, as illustrated in FIG. 5, the first cable **C1** connected to the link **121** of the seat cushion flip-up mechanism **60** is wired to extend from the lower portion of the casing **81** of the arranging unit **80** and to pass through the substantial center portion of the pan frame **22** in the width direction of the seatback **20**.

As illustrated in FIG. 5, the second cable **C2** connected to the headrest rotating mechanism **50** is wired to extend from the side portion of the casing **81** of the arranging unit **80** (precisely, the side portion facing the outside of the vehicle **1**) and be folded back so that the front end thereof is directed toward the slide member **54** of the headrest rotating mechanism **50**.

29

As illustrated in FIG. 5, the third cable C3 connected to the seatback folding mechanism 70 is wired to extend from the side portion of the casing 81 of the arranging unit 80 (precisely, the side portion facing the outside of the vehicle 1) and to be directed toward the attachment bracket 27 provided at the shoulder position of the seatback frame 21. Then, the third cable C3 is folded back at the side of the attachment bracket 27, and the front end thereof is connected to the connection portion 76 of the seatback folding mechanism 70.

As illustrated in FIG. 5, the fourth cable C4 connected to the folding angle detecting mechanism 130 is wired to extend from the lower portion of the casing 81 of the arranging unit 80 and to pass through the side portion facing the outside of the vehicle 1 in the pan frame 22. Here, a portion which comes out from the arranging unit 80 and is connected to the folding angle detecting mechanism 130 in the fourth cable C4 is bent and stretched along with the operation for folding the seatback 20 (in FIG. 5, the fourth cable C4 is bent in a V-shape). That is, an extra length portion (so-called allowance) is provided at the halfway position of the fourth cable C4, and the bending and stretching operation (flapping operation) is performed in response to the folding operation of the seatback 20.

As described above, since the bending and stretching operation of the fourth cable C4 is performed on the surface of the seatback frame 21 (the cable flaps), there is a need to ensure a space for accommodating the fourth cable C4 even when the operation of bending and stretching the fourth cable C4 is performed in the seatback frame 21. For this reason, in this embodiment, as illustrated in FIG. 16, the wiring space AS is provided between the side portion facing the outside of the vehicle 1 in the pan frame 22 and the pipe frame 23 located on the side portion, and the fourth cable C4 is located inside the wiring space AS.

In this embodiment, since the wiring space AS is formed, even when the bending and stretching operation (particularly, the bending operation) of the fourth cable C4 is performed, the fourth cable C4 may be accommodated in the same space to appropriately wire the fourth cable C4. Further, since the wiring space AS is formed, the fourth cable C4 is located below the pipe frame 23 in the bent state, and hence the contact with the pipe frame 23 may be prevented. Accordingly, it is possible to suppress the abnormal noise caused by the contact between the cable C and the pipe frame 23.

Furthermore, the outer edge of the portion forming the wiring space AS in the pan frame 22 is provided with a cable returning wall 22a with an upright wall shape. Since the cable returning wall 22a is formed, it is possible to regulate the fourth cable C4 located inside the wiring space AS from protruding toward the outside of the seatback frame 21. Accordingly, the fourth cable C4 is appropriately wired on the pan frame 22.

Further, in this embodiment, the wiring space AS is provided at the end closer to the arranging unit 80, that is, the end facing the outside of the vehicle 1 among both ends in the width direction of the seatback 20. Accordingly, it is possible to further exhibit of the effect of the wiring space AS.

Specifically, as described above, the arranging unit 80 is attached to the position slightly close to the outside of the vehicle 1 in the width direction of the seatback 20. Further, there is a need to wire the fourth cable C4 extending from the arranging unit 80 to the folding angle detecting mechanism 130 as an extremely short path from the viewpoint of ensuring the operation stability. In consideration of the above-described circumstance, in this embodiment, the fourth cable C4 is wired to pass through the side portion facing the outside of the vehicle 1 in the pan frame 22. Thus, since the flapping

30

of the fourth cable C4 occurs on the end facing the outside of the vehicle 1 in the pan frame 22, when the wiring space AS for absorbing the flapping may be provided at the end facing the outside of the vehicle 1, the effect may be further effectively exhibited.

Attachment Positions of Headrest Rotating Mechanism 50, First Driving Portion 140, and Second Driving Portion 150

As described above, in the vehicle seat S1 of this embodiment, the operation for folding the headrest 30 may be performed along with the operation of flipping up the seat cushion 10 to the flip-up position or the movement of the seatback 20 toward the folding position or may be independently performed. That is, the vehicle seat S1 according to this embodiment includes the first driving portion 140 which drives only the headrest rotating mechanism 50 by the operation of pulling the belt shaped member ST1 performed by the passenger, and the second driving portion 150 which drives the headrest rotating mechanism 50 along with the operation of flipping up the seat cushion 10 when the storing operation performed by the passenger is received by the storing operation belt shaped member ST2.

Here, the hooking rod 24 and one longitudinal end 54a of the slide member 54 as a main component of the first driving portion 140 are attached to the seatback frame 21. The arranging unit 80 and the extension portion 54b formed in the other longitudinal end of the slide member 54 as a main component of the second driving portion 150 are also attached to the seatback frame 21. That is, in this embodiment, the headrest rotating mechanism 50, the first driving portion 140, and the second driving portion 150 are all attached to the seatback frame 21.

With the above-described configuration, in this embodiment, the vehicle seat S1 with satisfactory assembling workability is realized. More specifically, the headrest rotating mechanism 50, the first driving portion 140, and the second driving portion 150 are all attached to the seatback frame 21, and the operation for folding the headrest 30 forward is performed on the seatback frame 21. That is, there is no need to pull a member (transmitting member) for transmitting a driving force such as the cable C into the headrest 30, as in the sheet structure of the related art, and hence the wiring length of the transmitting member may be further shortened. As a result, the transmitting member may be easily pulled (wired) inside the vehicle seat S1, and hence the vehicle seat S1 has satisfactory assembling workability.

OTHER EMBODIMENTS

In the above-described embodiment, the vehicle seat S1 has been described as an example of the conveyance seat of the present invention. However, the above-described embodiment is used to help the understanding of the present invention, and does not limit the present invention. The present invention may be modified and improved without departing from the spirit thereof, and the equivalent thereof is, of course, included in the present invention. Further, the above-described material or shape is merely an example for exhibiting the effect of the present invention, and does not limit the present invention.

Further, in the above-described embodiment, the vehicle seat S1 has been described which is stored in a manner such that the seatback 20 is folded forward along with the operation of flipping up the seat cushion 10 and the headrest 30 is folded forward by about 90°. However, the present invention is not limited thereto, and a vehicle seat with another configuration may be considered.

31

As an example of another configuration, a vehicle seat is considered which is folded in a manner such that the seatback 20 is folded forward to overlap the seat cushion 10 in a bent state without flipping up the seat cushion 10 and the headrest 30 is folded forward by about 90°. The present invention may be also applied to such a vehicle seat. That is, the present invention may be applied to the vehicle seat which is stored by folding the headrest 30 forward along with the movement of at least one of the seat cushion 10 and the seatback 20 to the storing position.

Specifically, as the configuration of the vehicle seat, there is a configuration in which the second driving portion 150 drives the headrest rotating mechanism 50 to perform the operation for folding the headrest 30 along with the movement of at least one of the seat cushion 10 and the seatback 20 to the storing position when the receiving portion such as the storing operation belt shaped member ST2 receives the storing operation performed by the passenger as in the above-described embodiment.

The present invention may be applied to such a configuration.

Further, in the above-described embodiment, the headrest rotating mechanism 50 and the arranging unit 80 respectively include individual casings 51 and 81, and the attachment positions of the respective casings 51 and 81 to the seatback frame 21 are set to be different from each other. However, the present invention is not limited thereto, and the attachment position of the casing 51 of the headrest rotating mechanism 50 and the attachment position of the casing 81 of the arranging unit 80 may be the same position. In other words, the bolt receiving portion 51a provided in the casing 51 of the headrest rotating mechanism 50 and the bolt receiving portion 81a provided in the casing 81 of the arranging unit 80 may receive the same stud bolt Bs to be simultaneously fixed by the stud bolt Bs.

Further, a configuration may be employed in which the headrest rotating mechanism 50 and the arranging unit 80 share the casing (that is, the casing 51 of the headrest rotating mechanism 50 and the casing 81 of the arranging unit 80 are integrated with each other).

Further, in the above-described embodiment, the belt shaped member ST1 is provided as a member that receives the operation performed by the passenger to independently fold only the headrest 30 forward, and the passenger performs the operation of pulling the belt shaped member ST1 as the operation. However, the present invention is not limited thereto. The operation may be received by another type as long as the headrest rotating mechanism 50 is driven (specifically, as long as the slide member 54 is slid) by using the operation performed by the passenger to independently fold the headrest 30 forward. For example, a press-type button may be provided in the seatback 20. In a case of such a press-type button, the structure becomes more complex than that of the belt shaped member ST1. However, since the press-type button does not extend from the seatback 20 as in the belt shaped member ST1, the press-type button has a better outer shape compared to the belt shaped member ST1.

REFERENCE NUMERALS

1 vehicle, 2 vehicle body floor, 3 luggage compartment part
10 seat cushion, 10a projection portion
11 cushion frame
20 seatback, 20a pedestal portion, 20b rotation shaft
21 seatback frame
22 pan frame, 22a cable returning wall
23 pipe frame, 24 hooking rod

32

25 pillar folding regulating portion, 26 reinforcing plate
27 attachment bracket, 28 abutting member
30 headrest
31 inner frame, 31a leg portion, 31b lower end flange portion
32 guide, 32a lower end flange
33 pillar, 33a vertical portion, 33b horizontal portion
33c pillar side engagement portion, 33d notch
40 armrest
50 headrest rotating mechanism
51 casing, 51a bolt receiving portion
52 biasing spring, 53 locking member
54 slide member, 54a one longitudinal end
54b extension portion
60 seat cushion flip-up mechanism
70 seatback folding mechanism, 71 biasing spring
71a one end, 71b other end
72 locking mechanism, 73 locking piece, 74 striker
75 base portion, 76 connection portion, 76a lower end
76b upper end
77 operation unit, 77a operation cover, 77b operation lever
77c connecting rod
80 arranging unit
81 casing, 81a bolt receiving portion, 81b guide slit
81c center region, 81d outer region, 82 rotation shaft
83 first rotating member, 83a cable locking portion, 83b tongue shaped portion
83c tongue shaped engagement portion, 83d protrusion portion, 83e circular-arc hole
84 second rotating member, 84a guide hole, 84b convex portion
84c protrusion portion, 84d outermost edge, 84e connection hole
85 third rotating member, 85a rotation shaft
86 engagement pin, 87 cushioning rubber, 87a support shaft
88a first coil spring, 88b second coil spring
88c third coil spring
90 seatback supporting unit, 91 locking pin
100 striker locking mechanism
101 locking portion, 102 locking piece, 103 housing
104 connection piece, 105 striker
110 attachment unit, 111 attachment plate
112 first plate portion, 112a upright wall portion
112b slit, 112c path defining portion
113 second plate portion, 114 attachment hole
114a front end, 114b center portion, 114c rear end
115 submarine bracket
120 movable unit, 121 link
121a abutting portion, 121b insertion hole
122 pipe rod, 123 connection bar
124 attachment bracket, 125 support mechanism
126A, 126B rotation shaft, 127 base bracket
127a upright wall portion
128 spiral spring, 129 damper rubber
130 folding angle detecting mechanism
140 first driving portion, 150 second driving portion
AS wiring space, Bs bolt, Bs stud bolt
C cable
C1 first cable, C2 second cable
C3 third cable, C4 fourth cable
S1, S11, S12 vehicle seat
ST1 belt shaped member, ST2 storing operation belt shaped member, Ws washer
The invention claimed is:
1. A conveyance seat comprising:
a seat cushion;
a seatback including a seatback frame therein; and
a forward foldable headrest;

33

the conveyance seat being stored by moving at least one of the seat cushion and the seatback to a storing position and folding the headrest forward;

the conveyance seat further comprising:

- a folding mechanism that performs a folding operation for folding the headrest forward;
- a first operating portion that is operable for folding only the headrest forward and is movably connected to the folding mechanism;
- a second operating portion that is operable for storing the conveyance seat;
- a first driving portion that drives only the folding mechanism by the first operating portion being operated to permit the folding mechanism to perform the folding operation; and
- a second driving portion that is movably connected to the second operating portion and drives the folding mechanism along with a movement of at least the one of the seat cushion and the seatback to a storing position to permit the folding mechanism to perform the folding operation when the second operating portion is operated,

wherein:

- the folding mechanism, the first driving portion, and the second driving portion are all attached to the seatback frame;
- the folding mechanism comprises:
 - a pillar that supports the headrest;
 - a support portion that supports the pillar to be rotatable in a front to back direction;
 - a biasing member that biases the pillar forward;
 - a locking member that engages with the pillar to hold the pillar in a standing state against a biasing force of the biasing member; and
 - a slide member that slides to release an engagement state between the locking member and the pillar,
- the first driving portion includes a fastening portion that is formed in the slide member to fasten the first operating portion and the slide member to each other;
- a movement mechanism is further provided which performs a movement operation for moving at least the one of the seat cushion and the seatback to the storing position by the second operating portion being operated;

34

the second driving portion includes a connection portion that is formed in the slide member to connect the movement mechanism and the slide member to each other; and

the fastening portion is located near the first operating portion in relation to the connection portion.

2. The conveyance seat according to claim 1, further comprising:

- a casing which accommodates the slide member,

wherein:

- a plate shaped pan frame and a pipe frame attached along an outer edge of the pan frame and located at a front side of the pan frame are provided in the seatback frame; and
- the casing is attached to a front surface of the pan frame and is located between a rear end of the pan frame and a front end of the pipe frame in the front to back direction of the seatback frame.

3. The conveyance seat according to claim 2, wherein:

- the slide member slides in a width direction of the seatback;
- the first operating portion is a belt shaped member that extends from an upper end surface of the seatback;
- only the headrest is folded by a pulling operation that pulls the belt shaped member along a height direction of the seatback intersecting the width direction;
- the first driving portion includes a converting portion that is interactively interfaced with the slide member and that converts the pulling operation along the height direction into a sliding movement of the slide member along the width direction; and
- the converting portion is a bending member that is attached to the seatback frame and abuts against the belt shaped member to bend the belt shaped member.

4. The conveyance seat according to claim 3, wherein the bending member abuts against the belt shaped member so that the belt shaped member is bent at a front side in relation to a front end of the pipe member in the front to back direction.

5. The conveyance seat according to claim 4, wherein:

- the conveyance seat is a vehicle seat mounted on a vehicle; and
- the belt shaped member extends from a portion in the upper end surface of the seatback located at an outside of the vehicle in relation to the headrest in the width direction.

* * * * *